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Occupational Projections and Training Data

1986 Edition

A Statistical and Research Supplement to the 1986-87 Occupational Outlook Handbook

Bulletin 2251

U.S. Department of Labor
Bureau of Labor Statistics
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A Statistical and Research Supplement
to the 1986–87 Occupational Outlook Handbook

U.S. Department of Labor
William E. Brock, Secretary

Bureau of Labor Statistics
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Preface

This statistical and research supplement to the 1986-87 *Occupational Outlook Handbook* is the seventh in a series dating to 1971 that presents the data underlying the information developed in the Bureau's occupational outlook program; since 1974, *Occupational Projections and Training Data* has been published biennially as a companion to the *Handbook*.

This bulletin was prepared in the Division of Occupational Outlook under the direction of Neal Rosenthal and Michael Pilot. Patrick Wash supervised its preparation. Alan Eck prepared the chapter on occupational separations and the material on occupational movements and replacement needs. Max L. Carey prepared the chapter on how workers get their training. Douglas Braddock prepared the information on broad occupational trends. Martha C. White prepared the employment and training profiles and assembled the detailed training data. Under the direction of Beverly A. Williams, word processing was handled by Brenda A. Marshall, Marilyn Queen, and Idena B. Sanders.

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Chapter 1. Using Occupational Data for Planning Education and Training Programs

The use of occupational information in planning education and training programs—especially information on future job prospects—has become increasingly important in the past decade. Not only has most Federal legislation dealing with career-oriented education and training during this period mandated its use in planning, but more occupational information has become available for use at the local level, where most planning is conducted. Much of the focus of the statutes governing education planning is on the use of occupational demand and supply information, where demand is specified as future growth and replacement needs, and supply is specified as the availability of trained workers. Comparisons of supply and demand are encouraged so that occupational training programs will be dropped or contracted in cases where supply is greater than demand and initiated or expanded when supply is less than demand. In practice, however, supply and demand analyses cannot be developed and presented in this simple straightforward manner. The complexities involved in projecting both demand and supply for most occupations result in data that leave much to be desired in reliability and comprehensiveness.

The complexities include, first, the difficulty of preparing projections of industry employment, which is one determinant of occupational demand. Industry employment projections in turn are dependent on the demand for goods and services produced in each industry, which is a function of consumer preferences, the world economy (which affects exports and imports), and Federal, State, and local government budgets. All of these factors are subject to great uncertainty. In addition, technological change continually affects the types of goods and services in demand as well as how they are produced. This in turn affects the growth of specific occupations. For example, the development of robots and the rate of dispersion of robots throughout industry will alter the occupational structure of industries, increasing the need for some occupations and reducing the need for others.

All of these factors are very difficult to project, and impossible to predict with perfect accuracy. Within the constraints of the economic models used to develop projections, however, exact statistical measures for such variables must be specified.[1] For example, estimates must be developed of the dollar value of output of the computer manufacturing industry. Clearly, in this dynamic industry, output growth cannot be predicted with precision, even though most analysts agree that the industry will grow significantly.

Job openings resulting from the need to replace individuals who leave their jobs, which is another component of demand, are perhaps even more difficult to project than occupational growth. However, job openings resulting from replacement needs are a more significant source of demand than occupational growth in virtually all occupations. Individuals leave their jobs for a wide variety of reasons. Some leave to work in another occupation that may have higher earnings, better working conditions, or more stable employment. Some workers lose their jobs and transfer to another occupation, sometimes after a period of unemployment. Others leave their jobs to retire, to attend school full time, or to take care of family responsibilities. The ability to develop a model that projects each of these situations accurately is severely hampered by a lack of data. However, even if data were available, they would be affected by so many constantly changing economic and social factors that perfectly accurate projections could not be developed.

If we turn to projections of supply, we are confronted by factors at least as complex as those involved in demand projections. First, for most occupations, there are a variety of ways to qualify for a job. In addition, in most occupations, one type of training is not predominant. Occupations such as physician, dentist, and veterinarian that require specific educational qualifications really are exceptions. Further, many individuals who complete a specific occupational training program do not enter that occupation. Also, employers are a major source of training for many occupations, but data are lacking on whether and to what extent employers provide training because trained workers are not available or because they feel they must do so to obtain the quality of workers they need. With the additional variable of the supply of workers arising from movement from one occupaton to another, projecting supply in most occupations is difficult.

[1] For details on BLS methods and assumptions used in developing projections, see appendix A and *Employment Projections for 1995: Data and Methods*, BLS Bulletin 2253.

Despite the difficulties, these data have been used in planning and providing education and training programs. In effect, proper planning can be done with less than perfect data. For example, although the exact rate of growth of an occupation such as computer programmer may be impossible to determine with accuracy, a relative growth rate can be developed with some confidence.

Evaluations of projections developed by the Bureau in the past illustrate this. Each time the target year of a set of projections is reached, BLS compares the projections with actual employment levels. These evaluations have shown that some occupational projections were far off the mark, but the vast majority were projected in the correct direction, and the amount of error was generally not so great as to have resulted in different decisions on the part of users who were aware of the nature of projections.

With all these considerations in mind, education officials and others who must make decisions on education and training programs will find valuable information in the chapters that follow.

Chapter 2 provides an overview of projected national employment trends over the 1984-95 period. It discusses projections of the population and labor force; projections of employment by broad industry group; and major trends in occupational employment. The information in chapter 2 can be used to place the data about detailed occupations in chapter 5 into a broad perspective.

Chapter 3 discusses occupational separations from the point of view of identifying replacement needs. Data on separations are available that measure the number of individuals who leave an occupation—except for deaths. These estimates, together with estimates of employment growth, are used to measure the total number of job openings in an occupation. However, since many jobs are filled by workers who transfer from other occupations, such estimates do not provide a good measure of training needs. Data that measure permanent separations from the labor force are more appropriate. Thus chapter 3 also discusses a method of estimating permanent separations.

Chapter 4 presents the results of a 1983 survey on the number of workers who needed training to qualify for their jobs and how they acquired that training. Data are presented for about 250 occupations. Appendix D shows, for each type of training, the significance of the training for major occupational groups and detailed occupations. For example, 28 percent of all those who reported that they acquired job skills in high school vocational programs were secretaries. The secretaries who received training in this manner accounted for 35 percent of all secretaries who were employed.

Chapter 5 presents employment profiles and supply profiles for detailed occupations. Information from a variety of sources is brought together to provide a picture of the types of workers employed in each occupation, the industries in which the occupation is concentrated, the unemployment rate relative to all occupations, the projected growth rate, and how that rate compares to the average for all occupations. It also presents the separation rate; the proportion of young, midcareer, and older workers; usual entry and training requirements; and education and training program completions. Where data are available, information also is presented on the characteristics of new entrants—their level of education and whether they are recent graduates, transfers from another occupation, or individuals returning to the work force.

The appendixes present a variety of statistics about occupations, including 1984 and projected 1995 employment by detailed occupation, the most current data available on enrollments and completions of public vocational education programs, noncollegiate postsecondary schools with occupational programs, apprenticeship programs, and Armed Forces training, as well as degrees conferred by 2-year colleges and other institutions of higher education. Sources of State and local occupational information are given in appendix F.

Chapter 2. Tomorrow's Jobs

The number and kinds of jobs needed in tomorrow's economy will depend on the interplay of demographic, economic, social, and technological factors. Some occupations will grow much faster than the average rate of growth in employment; others will decline in importance. Some jobs will emerge as a result of new technologies; others will disappear. And the nature of the work in most occupations will surely undergo change.

This chapter presents an overview of projected changes in the population, the labor force, and employment in major industrial sectors and broad occupational groups that should help put into perspective the information about detailed occupations presented in chapter 5. It also discusses the importance of replacement needs in the employment outlook.

Population

Changes in population are among the basic factors that will alter employment opportunities. Changes in the size and characteristics of the population affect the amount and types of goods and services demanded. They also affect the size and characteristics of the labor force—the people who are working or are looking for work—which in turn can influence the competition for jobs in an occupation. Three important population factors are population growth, shifts in the age structure of the population, and movement of the population within the country.

Growth. The population of the United States has increased throughout this century. However, the rate of growth was declining until the "baby boom" of the 1950's. During the late 1960's, the rate of population growth began to drop sharply and has remained at a low level since (chart 1).

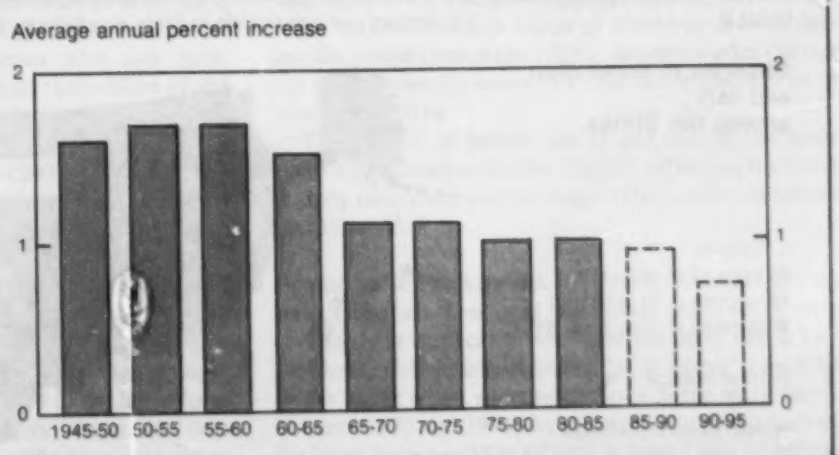
In 1984, the population was about 237 million. It is expected to increase to about 260 million by 1995. The rate of growth will be faster during the 1980's (1.2 percent a year) than during the early 1990's (0.8 percent a year). Continued population growth will mean more consumers to provide with goods and services, and thus a greater demand for workers in many industries and occupations.

Age structure. Over time, the age structure of the population changes, which affects the job market in many ways. The low population growth of the 1960's and 1970's, for example, resulted in fewer school-age children in the 1970's, which lowered the demand for educational services and the employment opportunities in teaching. Also during the 1970's, the entrance into the labor force of the large number of people born during the 1950's increased competition for entry level jobs.

The age structure of the population will continue to shift through the mid-1990's. The number of children under 13 will increase as the large number of people born during the 1950's continue to have children of their own.

Chart 1.

The population will grow more slowly through the mid-1990's.



SOURCE: Bureau of the Census

As the baby-boom group ages, the number of people age 35 to 54 will increase. The number of people 65 and older will rise sharply because of the relatively high population growth before the 1930's and increases in life expectancy. Low rates of population growth during the 1930's and 1970's will result in a decline by 1995 in the number of 55- to 64-year-olds and 14- to 25-year-olds.

The growing number of children will cause greater demand for elementary school education through 1995. The growing number of older people will add to the demand for health services. Shifts in the age structure of the population also will affect the labor force, discussed in a later section.

Movement of population. Population growth varies among the regions of the Nation. For example, between 1970 and 1980 the population of the Northeast and Midwest (formerly called North Central) regions increased by only 0.2 percent and 4.0 percent, respectively, compared with 20.0 percent in the South and 23.9 percent in the West. These patterns reflect the movement of people seeking new jobs or retiring and higher birth rates in some areas than others. Chart 2 shows the expected changes in State populations between 1980 and 2000 if these trends continue.

The overall movement of the U.S. populaton will be to the South and West. The West will continue to be the fastest growing region, increasing about 45 percent between 1980 and 2000. The South, with the largest absolute increase, will grow about 31 percent. The Midwest region is expected to increase only about 2 percent between 1980 and 1990, and to decline about 1 percent from 1990 to 2000. The population of the Northeast region will decline about 6 percent. By the year 2000, the West and the South will have about 60 percent of the Nation's population compared to about 52 percent in 1980.

The age distribution of the population will be oldest in the Northeast; almost 15 percent of its population will be age 65 or older. The West will have the youngest age distribution; over 22 percent of the population will be under age 15, and about 45 percent will be between the ages of 15 and 44. The age distribution of the South and Midwest regions will be similar to the national average.

Geographic shifts in the population alter the demand for and supply of workers in local job markets. In areas with a growing population, demand for public services and construction is likely to increase. At the same time, more people looking for work in an area could increase competition for jobs. Therefore, the areas with the fastest population growth may not necesarily offer the best job opportunities in every occupation; local employment opportunities in an occupation can differ greatly from national projections. Sources of information about local job market conditions can be found in appendix F.

Labor force

The size and characteristics of the labor force determine the number and type of people competing for jobs. In addition, the size of the labor force affects the amount of goods and services that can be produced. Growth, alterations in the age structure, and rising educational levels are among the labor force changes that will affect employment opportunities through the mid-1990's.

Growth. In 1984, the civilian labor force—people with jobs and people looking for jobs—totaled about 114 million. The labor force will grow through the mid-1990's, but at a slower rate than in the 1970's and first half of the 1980's (chart 3). Growth will be slower because the low birth rates during the 1960's and 1970's will result in fewer young people entering the labor force. By 1995, the labor force is projected to be about 129 million—an increase of about 14 percent from the 1984 level.

Chart 2.

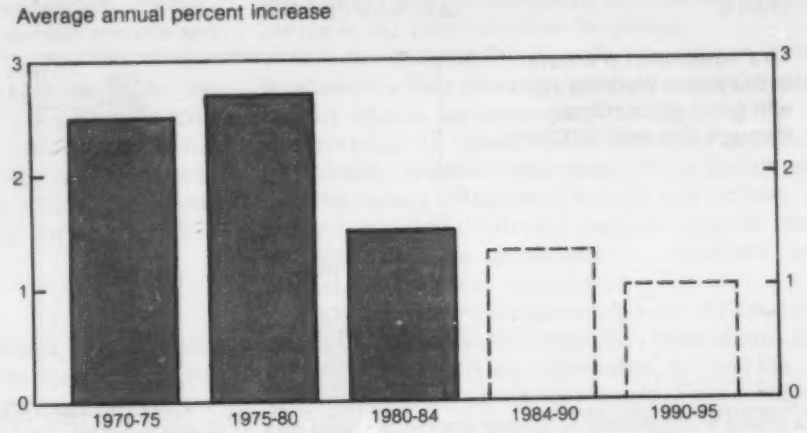
Changes in population will vary among the States.

Projected percent change in State populations, 1980 to 2000

SOURCE: Bureau of the Census

Chart 3.

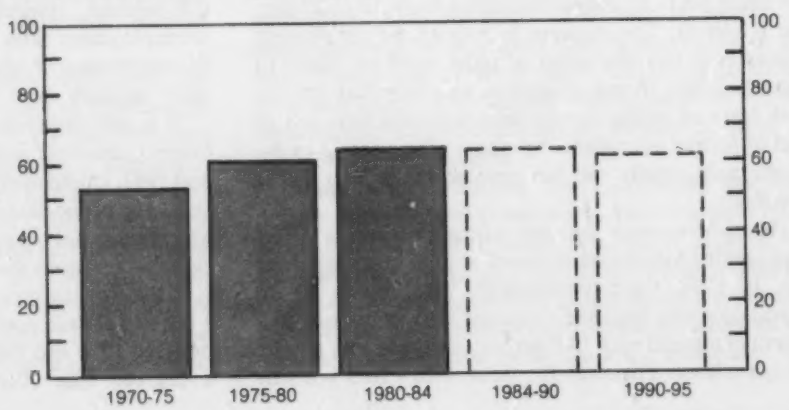
Labor force growth will slow through the mid-1990's.



SOURCE: Bureau of Labor Statistics

Chart 4.

Through the mid-1990's, women will account for over three-fifths of the growth in the labor force.



SOURCE: Bureau of Labor Statistics

Through the mid-1990's, the chief cause of labor force growth will be the continued though slower rise in the number and proportion of women who seek jobs. Women will account for more than three-fifths of the labor force growth during 1984-95 (chart 4).

Age structure. Through the mid-1990's, the number of people age 16 to 24 in the work force is projected to decline (chart 5). Fewer young entrants into the labor force may ease competition for entry level jobs. In fact, employers may have increasing difficulty in finding young workers. The decline in the number of young workers could be particularly important to the Armed Forces—the single largest employer of men in this age group.

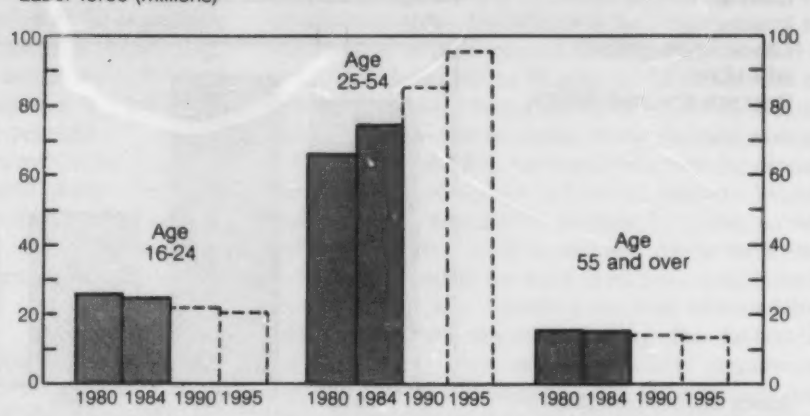
The number of people age 25 to 54 in the labor force is expected to increase considerably, from less than two-thirds of the labor force in 1984 to nearly three-fourths by 1995. The growing proportion of workers age 25 to 54 could result in higher productivity growth during this period than in the 1970's, because workers in this age group generally have work experience and tend to be more productive.

The number of people age 55 and over in the labor force is projected to decline slightly, reflecting the trend to early retirement and the drop in the number of people age 55 to 65.

Education. Employers seek to hire the best qualified persons available. This does not mean that they always choose those applicants who have the most education. However, individuals planning for a career should be aware of the rising educational level of the work force. Between 1970 and 1984, for example, the proportion of the labor force age 18 to 64 with at least 1 year of college

Chart 5.

The number of workers in the prime working ages will grow dramatically through the mid-1990's.



SOURCE: Bureau of Labor Statistics

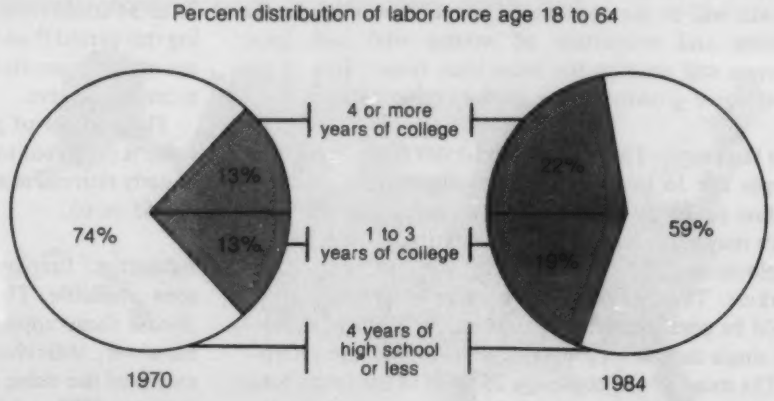
increased from 26 to 41 percent, while the proportion with 4 or more years of college increased from 13 to 22 percent (chart 6). The increase in educational attainment reflects both the retirement of older workers, many of whom had little formal education, and the influx into the work force of young people, who generally have a high level of formal education. Among workers age 25 to 34, for example, nearly half have completed at least 1 year of college.

The disadvantage that less educated workers suffer when seeking jobs is clearly shown in their unemployment rate. In 1984, the unemployment rate among 20- to 24-year-olds with less than 4 years of high school was 26.7 percent compared with 13.0 percent for those with 4 years of high school. The rates for those with 1 to 3 years of college and 4 or more years of college were only 7.8 and 4.9 percent, respectively. The association of higher unemployment rates with low levels of education shows the importance of education in a job market that increasingly requires more training.

It is also important to note that a college degree no longer guarantees success in the job market. Between 1970 and 1982, employment of college graduates grew 127 percent. The proportion employed in professional, technical, and managerial occupations, however, declined because these occupations did not expand rapidly enough to absorb the growing supply of graduates. As a result, roughly 1 out of 5 college graduates who entered the labor market between 1970 and 1984 took a job not usually requiring a degree. This oversupply of graduates is likely to

Chart 6.

During the 1970's and early 1980's, the proportion of workers with a college background increased substantially.



SOURCE: Bureau of Labor Statistics

continue through the mid-1990's. Not all occupations requiring a college degree will be overcrowded, however. Good opportunities will exist for systems analysts and engineers, for example.

Despite the generally competitive job market for college graduates, a college degree is still needed for most high-paying and high-status jobs. Persons interested in occupations that require a college degree should not be discouraged from pursuing a career that they believe matches their interests and abilities, but they should be aware of job market conditions.

Employment

The number of jobs in particular industries and occupations depends in large part on consumer, government, and business demand for goods and services produced by those industries and workers. Using a simple example, if people ate out more often, employment of cooks, waiters, and other restaurant workers would increase; employment of clerks and other grocery store workers would decline. In addition, employment in industries that produce restaurant equipment would grow; in industries that make grocery store equipment, employment would decline.

Consumer desire and government regulation, for example, led automobile manufacturers to improve the fuel efficiency of cars. To do this, auto manufacturers lightened the weight of cars by using plastic, aluminum, and specialty steel instead of standard iron and steel. This shift lowered the demand for goods from the iron and steel manufacturing industry, the iron and metallurgical coal mining industries, and of other industries that supply iron and steel manufacturers, so that employment in these industries has been adversely affected. At the same time, demand has increased for the products of the plastic, aluminum, and specialty steel industries and the industries that supply those manufacturers. Employment in those industries has benefited from the change.

As is clear from the first example, expansion or decline in industries affects growth in individual occupations differently because industries employ different mixes of workers (chart 7). Growth in manufacturing industries, for example, increases employment of production and material moving occupations, helpers, and laborers. In contrast, growth in the finance, insurance, and real estate industries increases employment of administrative, managerial, sales, and clerical workers.

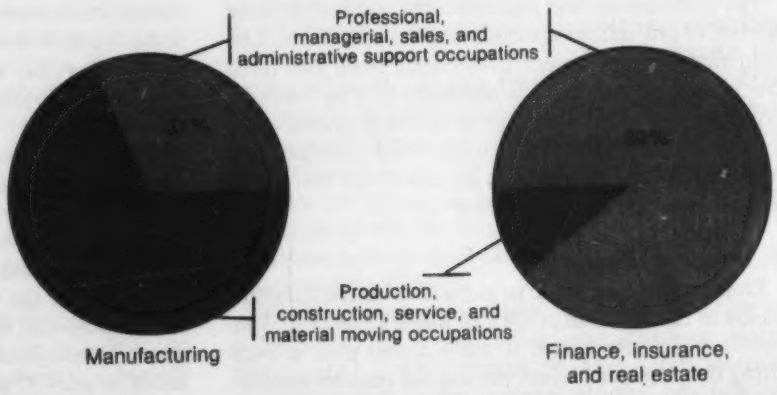
Changes in the manner in which goods are produced and services are provided also affect occupational and industrial employment. Increasing automation in automobile manufacturing, for example, is one of the factors expected to limit growth of assemblers, welders, and other production workers in that industry. The increasing use of word processing equipment will mean little or no growth of typists in most industries. However, the introduction of new technologies will probably increase employment of engineers, technicians, computer specialists, and repairers. The overall impact of technology will be to increase the amount of goods and services each worker can produce. Output of goods and services is expected to increase rapidly, however, so that employment should continue to increase in most industries and occupations.

Other factors affecting employment are the fiscal policies of the Federal Government, the monetary policies of the Federal Reserve Board, the level of imports, and the availability of energy. Using information on these and other factors, the Bureau of Labor Statistics has prepared three sets of projections of employment in industries and occupations. Referred to as the low-, moderate-, and

Chart 7.

Industries differ substantially in the kinds of workers they employ.

Percent distribution of wage and salary workers, 1984


Professional, managerial, sales, and administrative support occupations
Production, construction, service, and material moving occupations
Manufacturing
Finance, insurance, and real estate

SOURCE: Bureau of Labor Statistics

high-growth alternatives, the projections are based on differing assumptions concerning growth of the labor force, unemployment, monetary and fiscal policy, and other factors. Each alternative provides a different set of employment estimates for 1995.

It should be noted that none of the three projections should be favored as the most likely. The intent in preparing them was not to forecast future economic performance but, rather, to examine the implications of a reasonable range of demand growth over the projection period. The projections represent only three of many possible responses of the economy to differing fiscal and monetary stimuli. A different perspective on the inner workings of the U.S. aggregate economy could easily lead to completely different results. For this reason, the high- and low-growth alternatives should not be viewed as the "good" and "bad" forecasts but rather as vehicles for presenting a range of growth in gross national product (GNP) and employment to 1995.

Differences in occupational projections among the three alternatives should not be considered as the potential range within which the projections are likely to fall because the range for most occupations is much wider than that shown. The majority of occupations are sensitive to a wide variety of assumptions and economic factors and all of these could not be considered in the three scenarios.

The development of projections is not a precise statistical process. Despite the use of sophisticated economic models and data carefully developed by statistical techniques, the future cannot be precisely predicted. Too many factors can alter economic activity over the 1984-95 period to assure that the projections provide an exact picture of the future.

Some aspects of the development of these projections are more subjective than others. For example, in projecting occupational staffing patterns for many industries, judgments had to be made about the extent of office automation during 1984-95, and judgments about the use of this technology vary among analysts.

The assumptions and methods used to develop these alternative projections are discussed in appendix A. The occupational employment projections from the three alternatives are presented in appendix B. The Bureau's projections of labor force, gross national product, industrial output and employment, and occupational employment were described in articles in the November 1985 issue of the *Monthly Labor Review.*

Employment change

Employment is expected to increase from 106.8 million in 1984 to 122.8 million in 1995, or about 15 percent. This growth, while substantial, is much slower than growth during the previous 11-year period, for reasons discussed in the section on labor force growth. Employment change can be looked at in two ways: by industry and by occupation. The following two sections look at projected 1984-95 employment from both perspectives.

Industrial profile

To discuss employment trends and projections in industries, it is useful to divide the economy into nine industrial sectors under two broad groups—service-producing industries and goods-producing industries. In 1984, over 7 of every 10 jobs were in industries that provide services such as health care, trade, education, repair and maintenance, government, transportation, banking, and insurance. Industries that produce goods through farming, construction, mining, and manufacturing accounted for fewer than 3 out of every 10 jobs in the Nation.

Service-producing industries. Employment in service-producing industries has been increasing at a faster rate than employment in goods-producing industries (chart 8). Among the factors that have contributed to this rapid growth are rising incomes and living standards that result in greater demand for health care, entertainment, and business and financial services. In addition, the growth of cities and suburbs has brought a need for more local government services. Further, because many services involve personal contact, relatively fewer people have been replaced by machines in service-producing industries.

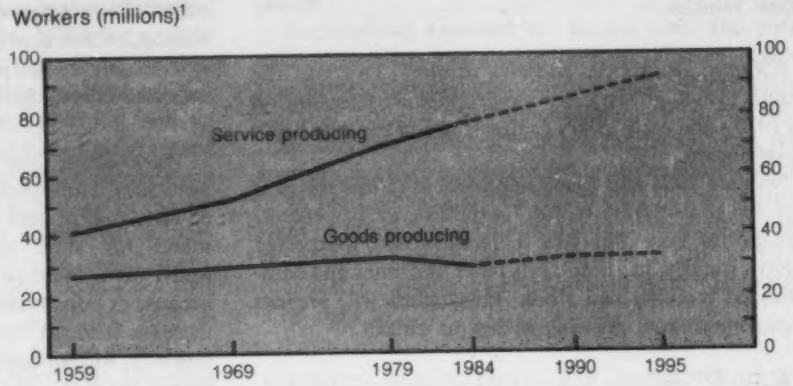
Through the mid-1990's, employment is expected to continue to increase faster in service-producing industries than in goods-producing industries. In fact, service-producing industries are projected to account for about 9 out of 10 new jobs between 1984 and 1995. Employment in these industries is expected to increase from 77.2 million in 1984 to 91.3 million in 1995, or 18 percent. Growth will vary among industries within the group (chart 9). The following paragraphs summarize recent trends and employment projections in the five industrial sectors that make up the service-producing industries.

Transportation, communications, and public utilities. Employment has increased in air transportation and transportaton services, but has declined in railroads and water transportation since 1979. Even in the communications industries, where demand has increased greatly, technological innovations have limited employment growth.

Between 1984 and 1995, employment in transportation, communications, and public utilities is expected to rise 14 percent, from 5.6 million to 6.4 million. Rising demand for new telecommunications services, resulting from the increased use of computer systems and the divestiture of the telephone company, will make communications the most rapidly growing industry in the sector. Employment in communications industries is projected to grow 17 percent, from 1.4 to 1.6 million. More efficient communications equipment, however, will keep employment from rising as rapidly as output.

Chart 8.

Industries providing services will continue to employ many more people than those providing goods.

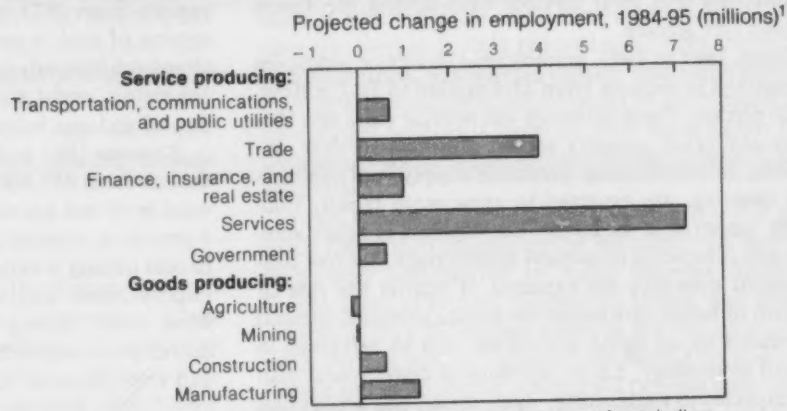


SOURCE: Bureau of Labor Statistics

[1]Includes wage and salary workers, the self-employed, and unpaid family workers.

Chart 9.

Through the mid-1990's, some industries will grow much faster than others.



SOURCE: Bureau of Labor Statistics

[1]Wage and salary employment except for agriculture, which includes self-employed and unpaid family workers.

Although employment in railroads is expected to decline, other transportation industries such as air, local transit, and trucking are expected to increase. However, deregulation will continue to have an impact in trucking, where a shift to self-employed truckers is expected, and in airlines, where a much slower rate of growth than in the past is projected. On the other hand, the transportation services industry (mostly travel agencies) will grow rapidly. Employment in transportation as a whole should rise 14 percent, from 3.2 million to 3.7 million.

Demand for electric power, gas utilities, and water and sanitary services will increase through the mid-1990's as population and industry grow. Employment in industries that deliver these services is expected to increase 13 percent, from 1.0 million to 1.2 million.

Trade. Both wholesale and retail trade employment have increased as the population has grown and as rising incomes have enabled people to buy a greater number and variety of goods. During the 1970's and early 1980's, employment in trade increased at about the same rate as in service-producing industries as a whole. Between 1984 and 1995, wholesale and retail trade employment is expected to grow from 24.3 to 28.3 million, or 16 percent. Employment will rise despite the use of laborsaving innovations such as computerized inventory systems and automated warehouses.

The largest number of new jobs in the trade sector is projected to be in eating and drinking places. Other retail firms expected to have large increases are department stores, grocery stores, and new car dealerships. In wholesale trade, the largest increases

will be in firms handling machinery, electric goods, and motor vehicles.

Finance, insurance, and real estate. This was the second fastest growing service-producing sector during the 1970's and early 1980's as financial and banking needs mushroomed.

Between 1984 and 1995, employment in this sector is expected to rise from 6.3 to 7.4 million, or 17 percent. Demand for credit and other financial services is expected to grow rapidly, but automatic teller machines and computerized banking and stock transactions will prevent employment from growing as fast as output.

Services. This sector includes a variety of industries, such as hotels, barber shops, automobile repair shops, hospitals, engineering firms, and nonprofit organizations. During the 1970's and early 1980's, employment in this sector increased faster than in any other sector. Sharply rising demands for health care, data processing, and engineering and legal services were among the forces behind this growth.

From 1984 to 1995, employment in service industries is expected to increase from 23.4 million to 31.2 million, or 30 percent. These industries will provide more new jobs than any other industry sector. Business services, including data processing, personnel supply, and commercial cleaning, are expected to grow more rapidly than other industries in the sector. Employment in health services also is expected to increase substantially, but cost containment measures are expected to restrict the rate of growth of health care industries despite increased demand generated by an aging population and by advances in health technology. Large increases in employment also are expected in engineering, legal, social, and accounting services.

Government. During the 1970's and early 1980's, government employment rose, although most of this growth was in State and local government prior to 1980. Between 1984 and 1995, employment is expected to rise only 7 percent, from 16.0 million to 17.1 million. State and local government growth is projected to be 9.0 percent, but Federal employment is expected to remain level. About 3 out of every 7 new jobs projected to be added in State and local government will be in education, which is projected to rise from 6.7 million in 1984 to 7.2 million in 1995. Employment in elementary schools is expected to rise faster than in high schools.

Goods-producing industries. Employment in these industries increased during the 1970's, but the 1980 and 1981-82 recessions caused a drop in employment. Although employment in these industries increased by 1984, it was still under their 1979 peak. Between 1984 and 1995, employment in goods-producing industries is expected to increase only 6 percent, from 29.6 to 31.4 million, which is only slightly higher than employment in 1979. Significant variations in employment growth is expected among goods-producing industries (chart 9).

Agriculture. The use of machinery, fertilizers, feeds, pesticides, and hybrid plants has made possible increased farm output with a smaller work force. Domestic demand for food will increase slowly through the mid-1990's. Worldwide demand for food will increase because of population growth, and U.S. food exports will increase through the next decade. Farm productivity, however, will continue to improve—although more slowly than in the past—and employment is expected to continue to decline even as production rises. Between 1984 and 1995, agricultural employment is projected to drop 7 percent, from 3.3 to 3.0 million jobs.

Mining. Employment in the mining sector increased rapidly from 1973 to 1981, primarily due to increased mining of coal in response to oil shortages. It then declined substantially due to recession, foreign competition for metals, and a drop in the price of oil which brought the oil and gas boom of the early 1980's to a halt.

Between 1984 and 1995, employment is expected to decline from 651,000 to 631,000, or 3 percent. Employment in oil and gas extraction is expected to increase only 1 percent as domestic production levels off; employment in coal mining is expected to decline due to productivity improvements and expected slow growth in demand. Most other mining industries are expected to have decreases in employment because of import competition and improvements in mining technology.

Construction. Employment in construction dropped considerably between 1979 and 1982, as high interest rates and low economic activity limited new construction, but has since rebounded and now is higher than in 1979 because of lower interest rates and increased economic activity.

The construction industry is expected to benefit from an anticipated growth in investment, particularly after 1990. Between 1984 and 1995, employment in the construction sector is expected to increase 12 percent, from 5.9 to 6.6 million. Through the late 1980's, the demand for housing is expected to be strong as interest rates are projected to drop slowly and as the industry continues to recover from the low level of new residential construction during the 1980-82 recession years. During the early 1990's, the growth in households will slow and possibly limit the demand for new housing. Nonresidential construction is projected to recover from the recent oversupply of commercial office buildings and also to grow as factory modernization accelerates.

Manufacturing. Improved productivity and import competition caused a 1.6 million drop in manufacturing employment between 1979 and 1984, following a slight increase during the 1970's. Employment is expected to increase 7 percent, from 19.8 million in 1984 to 21.1 million in 1995 due to strong demand resulting from an expected capital spending boom and continued strong growth in defense expenditures. Only modest employment gains in manufacturing are expected because of the anticipated productivity increase from investment in high-technology capital equipment. Despite this growth, employment in 1995 will still be slightly below the 1979 level. Several key manufacturing industries, such as automobile and steel manufacturing, are not expected to reach previous peak employment levels. On the other hand, the computer, materials handling equipment, and scientific and controlling instrument industries will be among the fastest growing industries.

Manufacturing is divided into two broad categories—durable and nondurable goods manufacturing. Employment in durable goods manufacturing is expected to increase by 12 percent due to rising business, military, and consumer demand for computers, machinery, and electronic components. However, employment in nondurable goods manufacturing is projected to decline by 2 percent, reflecting the tendency of consumers to spend less of their budget on staples such as food and clothing as their income rises.

Occupational profile

This section gives an overview of the changes expected in employment for 16 broad groups of occupations. These groups are based on the Standard Occupational Classification, which has been adopted as the classification system for all government agencies that collect occupational employment data.

The economy is expected to generate 15.9 million additional jobs between 1984 and 1995. Thirty-seven occupations are expected to account for about one-half of this projected job growth (table 1). These occupations are numerically large—all had 237,000 or more workers in 1984. Occupations that require extensive training are not found to any greater extent in table 1 than are those requiring little formal training. Only one-fourth of the occupations generally require a college degree.

The occupations with the highest growth rates between 1984 and 1995 are shown in table 2. The list is dominated by occupations that are tied to expanding industries and which have been among the fastest growing in the economy for the past decade. Almost half of the 20 occupations in the list are either in the computer or health fields. For some occupations, the high growth rates reflect recovery from the recession. Note also that the fastest growing occupations generally are not found on the list of occupations that will add the most jobs over the period.

Occupations expected to decline over the period generally are concentrated in industries that are contracting or being severely affected by technological change (table 3). For example, railroad brake, signal, and switch operators are concentrated in a declining industry, while stenographers are being affected by technological change.

In the following discussion, the employment growth rates of individual occupations usually are compared to the national average for all occupations. The six phrases that describe employment growth are explained in figure 3 on page 32.

Executive, administrative, and managerial occupations. In most of these occupations, employment is expected to increase about as fast as the average for all occupations. However, faster growth is expected for occupations in fast-growing industries. For example, employment of managers in the health industry is expected to increase much faster than the average. Employment of administrators and managers should grow faster than the average in data processing services, credit and securities firms, automotive repairs, and social services. In contrast, managerial employment in government and educational services is likely to grow more slowly than the average due to the anticipated modest growth of these industries.

Employment of accountants and auditors will grow much faster than the average as managers rely more on accounting information to make business decisions. Employment of buyers, purchasing agents, and personnel specialists will increase about as the fast as average, while employment of construction inspectors and compliance and enforcement officers will increase more slowly than the average.

Because of the increasing number of people seeking managerial and administrative jobs and the increasing technical requirements in many of these occupations, experience, specialized training, or postbaccalaureate study will be needed for more of them. Familiarity with computers will be needed in more jobs as managers and administrators increasingly rely on computerized information systems to direct their organizations.

Engineers, scientists, and related occupations. Employment in most of the occupations in this group is expected to increase as fast as or faster than the average; employment of engineers and systems analysts is expected to grow much faster than the average.

Increased military expenditures, growing demand for computers and other electronic equipment, expansion and automation of industrial production, and development of energy sources are some of the factors expected to lead

Table 1. Occupations with the largest job growth, 1984-95
(Numbers in thousands)

Occupation	Change in employment 1984-95		Percent of total job growth 1984-95
	Number	Percent	
Cashiers	556	29.8	3.6
Registered nurses	452	32.8	2.8
Janitors and cleaners, including maids and housekeeping cleaners	443	15.1	2.8
Truckdrivers	428	17.2	2.7
Waiters and waitresses	424	26.1	2.7
Wholesale trade sales workers	369	29.6	2.3
Nursing aides, orderlies, and attendants	348	28.9	2.2
Salespersons, retail	343	12.6	2.2
Accountants and auditors	307	34.8	1.9
Teachers, kindergarten and elementary	281	20.3	1.9
Secretaries	268	9.6	1.7
Computer programmers	245	71.7	1.5
General office clerks	231	9.6	1.4
Food preparation workers, excluding fast food	219	22.1	1.4
Food preparation and service workers, fast food	215	17.9	1.4
Computer systems analysts, electronic data processing	212	68.7	1.3
Electrical and electronics engineers	206	52.8	1.3
Electrical and electronics technicians and technologists	202	50.0	1.3
Guards	188	25.6	1.2
Automotive and motorcycle mechanics	185	20.1	1.2
Lawyers	174	35.5	1.1
Cosmetologists and related workers	150	28.7	.9
Cooks, restaurant	138	29.7	.9
Maintenance repairers, general utility	137	15.6	.9
Bookkeeping, accounting, and auditing clerks	118	6.0	.7
Bartenders	112	27.9	.7
Computer operators, excluding peripheral equipment	111	46.1	.7
Physicians and surgeons	109	23.0	.7
Licensed practical nurses	106	17.6	.7
Carpenters	101	10.7	.6
Switchboard operators	100	28.7	.6
Food service and lodging managers	89	13.6	.6
Electricians	88	16.2	.6
Teacher aides and educational assistants	88	18.3	.6
Blue-collar worker supervisors	85	5.8	.5
Receptionists and information clerks	83	18.2	.5
Mechanical engineers	81	34.0	.5

NOTE: Includes only detailed occupations with 1984 employment of 25,000 or more. Data for 1995 are based on moderate-growth projections.

to higher employment in engineering occupations. The growing application of computers in business and research will contribute to increased employment of systems analysts. Research to expand basic knowledge, develop new technologies and products, and protect the environment is expected to lead to higher employment in scientific occupations, although employment will grow more slowly for scientists than for engineers.

Social science, social service, and related occupations. Employment in many of the occupations in this group is expected to grow about as fast as the average. However, due to the number of people interested in these fields, competition for jobs is expected in many social science occupations—especially for academic positions. Generally, prospects will be better for those with advanced degrees who seek work in applied fields. Competition also is likely for jobs as social and recreation workers in public and voluntary agencies as well as for salaried positions for lawyers.

Teachers, librarians, and counselors. Because of anticipated enrollment declines and an abundance of qualified jobseekers, competition is expected for college and university faculty.

Because elementary school enrollments are increasing, employment of elementary school teachers is expected to grow rapidly. Prospects in secondary schools should improve in the early 1990's, as enrollments there begin to increase. Also, college faculty and librarians in scientific

Table 2. Fastest growing occupations, 1984-95

Occupation	Percent growth in employment
Paralegal personnel	97.5
Computer programmers	71.7
Computer systems analysts, electronic data processing (EDP)	68.7
Medical assistants	62.0
Data processing equipment repairers	56.2
Electrical and electronics engineers	52.8
Electrical and electronics technicians and technologists	50.7
Computer operators, except peripheral equipment	46.1
Peripheral EDP equipment operators	45.0
Travel agents	43.9
Physical therapists	42.2
Physician assistants	40.3
Securities and financial services sales workers	39.1
Mechanical engineering technicians and technologists	36.6
Lawyers	35.5
Correction officers and jailers	34.9
Accountants and auditors	34.8
Mechanical engineers	34.0
Registered nurses	32.8
Employment interviewers, private or public employment service	31.7

NOTE: Includes only detailed occupations with 1984 employment of 25,000 or more. Data for 1995 are based on moderate-growth projections.

and technical fields generally will face better job prospects.

Employment of vocational and educational counselors will grow as fast as the average, although growth will be faster in areas other than in schools, especially in mental health counseling.

Health-related occupations. This group includes health practitioners, nurses, health technicians and technologists, health service workers, dietitians, pharmacists, and therapists.

Employment in most health occupations is expected to grow faster than the average as population growth—especially in the number of older people—increases the demand for health care. Registered nurses and nursing aides and orderlies, because of the large size and anticipated growth of these occupations, will be among the occupations providing the most new jobs through the mid-1990's. Despite the anticipated growth in the health industry, physicians, dentists, chiropractors, and veterinarians seeking to establish a practice can expect unprecedented competition due to the large number of newly trained practitioners entering those fields each year.

Pressure to contain costs, especially in hospitals, and technological advances will affect the projected rates of growth in many health-related occupations. For example, physician assistants, medical record technicians, and medical assistants will grow much faster than the average, but automation of laboratory procedures will make for slower than average growth for medical and clinical laboratory technologists.

Writers, artists, and entertainers. This group includes reporters, writers, designers, public relations specialists, and performing artists. In most of these occupations, employment is expected to increase as fast as the average for all occupations. The continued importance of advertising, public relations, print and broadcast communications, and entertainment will spur employment growth.

Stiff competition for these jobs is likely, due to the large numbers of people they attract. Talent and personal drive will continue to play an extremely important role in success in these occupations. Within individual occupations, some areas will offer better job prospects. The best prospects for writers and editors, for example, will be in technical writing and in preparing business and trade publications.

Technologists and technicians. Workers in this group provide technical assistance to engineers, scientists, and other professional workers as well as operate and

Table 3. Fastest declining occupations, 1984-95

Occupation	Percent change in employment
Stenographers	-40.3
Shoe sewing machine operators and tenders	-31.5
Railroad brake, signal, and switch operators	-26.4
Railcar repairers	-22.3
Furnace, kiln, or kettle operators and tenders	-20.9
Shoe and leather workers and repairers precision	-18.6
Private household workers	-18.3
Station installers and repairers, telephone	-17.4
Sewing machine operators, garment	-16.7
Textile machine operators, tenders, setters, and set-up operators, winding	-15.7
Machinery maintenance mechanics, textile machines	-14.8
Statistical clerks	-12.7
Industrial truck and tractor operators	-11.9
Central office operators	-11.5
Farm workers	-11.2
College and university faculty	-10.6
Farm and home management advisers	-9.6
Extruding and drawing machine setters and set-up operators, metal and plastic	-9.1
Pressing machine operators and tenders, textile, garment and related	-8.8
Postal service clerks	-8.5

NOTE: Includes only detailed occupations with 1984 employment of 25,000 or more. Data for 1995 are based on moderate- growth projections.

program technical equipment independently. The continued growth in the importance of technology to national defense, office work, manufacturing, and other activities is expected to cause much faster than average employment growth for several occupations in this group, such as programmers and electrical and electronics technicians. Legal assistants are projected to grow faster than any other occupation as more of them are employed to aid lawyers and because of the expected growth in the demand for legal services.

Growth in some occupations will be limited by changes in technology. Employment of drafters is expected to increase much more slowly than the demand for drafting services because of the increasing use of computer-aided design equipment. Similarly, little or no change is expected in the employment of air traffic controllers because of the automation of air traffic control equipment.

Marketing and sales occupations. Employment of travel agents, securities sales workers, and real estate agents is expected to grow faster or much faster than the average due to the anticipated growth of the industries in which these workers are employed.

Many part-time and full-time job openings are expected for cashiers and retail trade sales workers due to the large size, high turnover, and expected employment growth in these occupations. Higher paying sales occupations, such as insurance agent and real estate agent, tend to be more competitive than retail sales occupations. Well-trained, ambitious people who enjoy selling will have the best chance for economic success.

Administrative support occupations, including clerical. Workers in this group prepare and record letters and other documents; collect accounts; gather and distribute information; operate office machines; and handle other tasks that help run businesses, government agencies, and other organizations. The increase in office automation systems will limit employment opportunities in some administrative support occupations. Changes in organizational practices also will affect some of these occupations. Despite a growing volume of mail, little change is expected in the employment of mail carriers because of improved routing programs and more centralized mail delivery. However, despite the projected slow growth, several occupations in this group will provide many full- and part-time job openings due to their large size and high turnover. These include bank tellers, bookkeepers and accounting clerks, secretaries, shipping and receiving clerks, and typists.

Some administrative support occupations will enjoy faster or much faster than average employment growth. Employment of computer operators and peripheral equipment operators, for example, is expected to grow much faster than the average due to the increased use of computer systems, and employment of telephone operators outside of telephone companies is expected to grow faster than the average due to business expansion.

Service occupations. This group includes a wide range of workers in protective, food and beverage preparation, cleaning, and personal services and is expected to account for more job growth than any other broad group. Among the protective service occupations, correction officers are expected to have much faster than average growth because of the increasing number of inmates, and guards are expected to have faster than average growth because of increased concern over crime and vandalism. Employment of police officers and firefighters is expected to increase about as fast as the average.

Rising incomes and the growing number of men and women who combine family responsibilities and a job are expected to contribute to faster than average employment growth among food and beverage preparation and service occupations, such as bartender, cook, waiter, or waitress. Due to the large size, high turnover, and growth of these occupations, full- and part-time job openings will be plentiful.

Agricultural and forestry occupations. Demand for food, fiber, and wood is expected to increase as the world population grows. The development and use of more productive farming and forestry methods, however, is expected to result in declining employment in most agricultural and forestry occupations.

Mechanics and repairers. These workers adjust, maintain, and repair automobiles, industrial equipment, computers, and many other types of machinery. Employment in most of these occupations is expected to grow about as fast as the average due to the greater use of machines throughout the economy. In some, employment will increase faster than the average. The increased use of computers and advanced office machinery, for example, will make employment of computer service technicians and office machine repairers grow much faster than the average. However, more reliable, easy-to-service machinery will limit employment growth for some mechanic and repairer occupations, such as communications equipment mechanics.

Construction occupations. Workers in this group are expected to experience average employment growth between 1984 and 1995. A rapid rise in spending for new industrial plants and an increase in the number of households are factors expected to lead to more new construction. Alteration and modernization of existing structures, as well as the need for maintenance and repair on highway systems, dams, and bridges, also will contribute to increased construction activity. However, the construction industry is very sensitive to changes in the Nation's economy, and employment in construction occupations drops sharply during recessions.

Production occupations. Workers in these occupations perform tasks involved in the production of goods. They set up, adjust, operate, and tend machinery and equipment, and use handtools and hand-held power tools to fabricate and assemble products. More efficient production techniques such as computer-aided manufacturing and the increased use of lasers and industrial robots will prevent employment in many production occupations from rising as rapidly as the output of goods. However, there will still be many openings in this group because of its large size.

Many production occupations are sensitive to changes in the economy. When factory orders decline during an economic downturn, workers may experience shortened workweeks, layoffs, and plant closings.

Transportation and material moving occupations. Workers in this group operate the equipment used to move people and materials. An increase in demand for transport services is expected to result in average growth for truckdrivers and faster than average growth for airplane pilots. Increased use of automated material handling systems, however, is expected to cause a decrease in employment of industrial truck operators.

Handlers, equipment cleaners, helpers, and laborers. Workers in this group assist skilled workers and perform the routine, unskilled tasks required to complete a project. Employment in these occupations is expected to grow more slowly than the average as routine tasks are mechanized, but jobs in these occupations are expected to be plentiful due to the high turnover. However, economic downturns can lower the number of openings substantially. This is particularly true for construction laborers and other workers in industries that are sensitive to changes in the Nation's economy.

Because the employment prospects in individual occupations will differ within each of the 16 groups, it is important to check the outlook for each occupation that interests you. Current and projected employment estimates for about 500 occupations are presented in appendix B.

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Chapter 3. Occupational Separations

Chapter 2 provided an overview of the Bureau's 1984-95 projections and discussed factors affecting employment trends in industries and occupations. Changes in the level of employment provide one measure of job openings. Another and generally much more significant source of openings arises from the need to replace individuals who leave an occupation. To provide information about replacement needs, this chapter examines 1983-84 data on separations for all reasons—"gross separations." These data measure the proportion of workers who leave an occupation to transfer to another occupation, become unemployed, or leave the labor force.[1]

Information about gross separations is useful not only to identify employment opportunities, but also to indicate the relative attachment of individuals to an occupation. However, many individuals who leave an occupation may return to work in the occupation at a later date. Thus, for purposes such as planning training programs, a measure of the number of persons who leave the occupation permanently is needed to supplement the measure of gross separations. This chapter discusses a way to estimate permanent labor force separations.

Readers are cautioned that the data presented in this chapter are derived from the Current Population Survey (CPS) rather than the Occupational Employment Statistics (OES) survey, which provides the data given elsewhere in this bulletin. Readers also are cautioned that the 1983 and 1984 CPS data are based on the 1980 Census of Population occupational classification system and are not comparable with data published in the previous edition of this bulletin. Finally, the 1983-84 data reflect a period of improving economic conditions and may not be representative of other time periods. Detailed information about the methodology for developing gross separation data for 1980-81 appears in the March 1984 *Monthly Labor Review*.[2] That methodology is virtually dentical to the one used to develop the 1983-84 data presented here.[3]

[1] Workers who change jobs but remain in the same occupation and those who die are not counted. Occupational data on deaths are not available. This exclusion biases the estimates of separations downward 0.4 to 0.7 percent. For additional information, see *Occupational Projections and Training Data*, 1982 edition, Bulletin 2202 (Bureau of Labor Statistics, 1982), p. 74.

[2] Alan Eck, "New Occupational Data Improve Replacement Estimates," *Monthly Labor Review*, March 1984, pp. 3-10.

Gross separations

Employment opportunities arise from the creation of new jobs and from the need to replace workers. "Gross separation" data identify those workers who leave an occupation and who must be replaced if the employment level is to be maintained. The significance of replacement needs as a source of employment opportunities is shown in table 4. In 1983-84, replacements accounted for 81 percent of all job openings—18.1 million compared with 4.2 million due to growth. In farming, forestry, and fishing occupations, replacement needs were the only source of jobs, since employment declined. The importance of replacement needs is generally greatest in occupations with high separation rates, such as administrative support and service occupations. In those groups, over 90 percent of all opportunities resulted from the need to replace workers.

As shown in table 5, about 18 percent of all employed persons left their occupation between 1983 and 1984 to transfer to another or to stop working. Slightly less than half, 8 percent, transferred to another occupation; 3 percent became unemployed; and 7 percent dropped out of the labor force.

Professional specialty occupations; executive, administrative, and managerial occupations; and technicians and related support occupations had the lowest separation rates (between 11 and 13 percent), while private household workers had by far the highest (40 percent). At 28 percent, the rate for handlers, equipment cleaners, helpers, and laborers also was significantly above the rest of the groups.

Separation rates differ significantly among detailed occupations (see appendix table C-1). Occupations with high separation rates typically require little education and training and have a large proportion of young workers. Such occupations include childcare workers, news vendors, and food counter workers. Many of the jobs in these occupations are for part-time workers and are filled by youth between the ages of 16 and 19 who are still in school.

[3] Briefly, the methodology consists of creating a matched sample, for each of 12 months, of 505,000 persons age 15 and older in the initial year. Matched data about changes in labor force status then were merged with data on occupational transfers from a special study conducted as part of the January 1983 Current Population Survey. The results, termed merged data, provide a composite description of movements into, out of, and between occupations over a 1-year period.

Table 4. Job openings, 1983-84

(Thousands)

Occupational group	Total openings	Employment change[1]	Replacement needs[2]	
			Number	Percent of total openings
Total, all occupations	22,250	4,171	18,079	81.3
Executive, administrative, and managerial	2,017	799	1,238	61.4
Professional specialty	1,838	466	1,372	74.6
Technicians and related support	504	119	385	76.4
Sales occupations	3,104	764	2,340	75.4
Administrative support, including clerical	3,491	327	3,164	90.6
Private household occupations	402	13	389	96.8
Service workers, except private household	3,476	282	3,194	91.9
Farming, forestry, and fishing	696	(-100)	696	100.0
Precision production, craft, and repair	2,566	729	1,837	71.6
Machine operators, assemblers, and inspectors	1,750	240	1,510	86.3
Transportation and material moving occupations	1,052	266	786	74.7
Handlers, equipment cleaners, helpers, and laborers	1,436	268	1,170	81.5

[1] Calculated by subtracting 1983 annual average employment from 1984 annual average employment. Where the change is negative, replacement needs are the sole source of openings.

[2] Calculated by applying 1983-84 separation rates from table 5 to 1983 Current Population Survey annual average employment.

SOURCE: Bureau of Labor Statistics.

In contrast, occupations with very low separation rates, such as physician, dentist, and lawyer, typically have extensive educational requirements or a large proportion of older male workers. However, tool-and-die makers also have a low separation rate. This occupation does not require extensive education but does require specialized training, has a relatively large proportion of workers over 45 years of age, and a very high proportion of men.

Occupations with high and low separation rates, as measured by the percent of workers leaving their occupation over a 12-month period during 1983-84, are shown in the following tabulations:

Occupations with high separation rates

Childcare workers, private household
News vendors
Food counter, fountain, and related occupations
Waiters'/waitresses' assistants
Attendants, amusement and recreation facilities
Street and door-to-door sales workers
Garage and service station related occupations
Helpers, construction trades
Childcare workers, except private household
Information clerks, n.e.c.
Graders and sorters, except agricultural
Messengers
Stock handlers and baggers
Interviewers
Sales workers, apparel
Waiters and waitresses
Bartenders
Miscellaneous food preparation occupations
Personal service occupations, n.e.c.
Kitchen workers, food preparation

Occupations with low separation rates

Physicians
Pharmacists
Dentists
Firefighting occupations
Lawyers
Operations and systems researchers and analysts
Civil engineers
Electrical and electronics engineers
Police and detectives, public service
Teachers, special education
Architects
Clergy
Chemists, except biochemists
Tool-and-die makers
Telephone installers and repairers
Securities and financial services sales occupations
Personnel and labor relations managers
Postal clerks, except mail carriers
Electrical and electronics technicians

Transfers to other occupations. Occupational transfers accounted for almost one-half of all separations during the 1983-84 period. This pattern was observed for a very large proportion of occupations (see appendix table C-1). A low transfer rate is characteristic of an occupation such as physician but also is typical of occupations in which workers have little attachment to the labor force or few transferable skills, for example, private household worker. These workers are six times more likely to stop working than to transfer to another job.

A high transfer rate sometimes identifies an entry level or career ladder occupation. For example, computer operators had a higher than average transfer rate (13 percent) but a lower than average proportion of persons who were not working a year later (6 percent). This pattern—transfers twice as high as total separations—indicates that most computer operators who leave move to another occupation.

Not working. Movement into the "not working" group was responsible for slightly over half of all separations. This group includes workers who become unemployed and those who separate from the labor force.[4] Executive, administrative, managerial, and professional specialty occupations—those generally requiring the most training and commanding the higest earnings—had the lowest rates of movement into "not working" (6 percent).

[4] Even though a job is not created when a person becomes unemployed, openings due to movements into unemployment are a component of employment growth not captured by changes in employment levels. For more information, see *Occupational Projections,* 1982 edition, p. 70.

Table 5. Separation rates for major occupational groups, 1983-84

(Percent)

Occupational group	Separation rates, 1983-84[1]				
	Total	Transfers to other occupations	Not working		
			Total	Unemployed	Not in the labor force
Total employed, age 16 and over	17.8	8.0	9.8	2.8	7.0
Executive, administrative, and managerial	11.7	6.0	5.6	1.4	4.2
Professional specialty	10.7	4.9	5.8	1.1	4.7
Technicians and related support	12.6	6.1	6.5	2.8	4.3
Sales occupations	19.8	9.5	10.3	2.5	7.8
Administrative support occupations, including clerical	19.3	9.2	10.1	2.4	7.7
Private household occupations	39.7	5.1	34.6	6.1	28.5
Service workers, except private household	24.8	9.6	15.3	3.7	11.6
Farming, forestry, and fishing	21.5	5.2	16.3	3.0	13.3
Precision production, craft, and repair	14.9	7.0	7.9	3.4	4.5
Machine operators, assemblers, and inspectors	19.5	9.6	10.0	4.2	5.8
Transportation and material moving occupations	18.7	10.4	8.3	3.6	4.7
Handlers, equipment cleaners, helpers, and laborers	28.2	13.3	14.9	6.6	8.3

[1] The occupational separation rate is the percentage of individuals previously employed in an occupation who are not employed in that same occupation a year later. Occupational transfers occur if individuals remain employed, but in a different occupation. Separations exclude deaths.

NOTE: Due to rounding, individual items may not add to totals.
SOURCE: Merged Current Population Survey data. The methodology used to develop the data is presented in "New Occupational Data Improve Replacement Estimates," *Monthly Labor Review*, March 1984.

At the other extreme, private household workers had the highest rate (29 percent). Private household workers are primarily childcare workers or cleaners and servants. The former are predominantly younger workers; the latter, older workers. However, both groups primarily work part time, receive low wages, and have few transferable skills.

Labor force separations accounted for about two-thirds of all movement into the not working group. This pattern was found for most occupations (see appendix table C-1). Workers in construction occupations, who are equally likely to become unemployed or to leave the labor force, were an exception; construction workers frequently encounter delays in obtaining new jobs when work at a given site is completed. To a lesser extent, this pattern was exhibited by machine operators, assemblers, and inspectors as well as by handlers, equipment cleaners, helpers, and laborers. Workers in these occupations are subject to layoffs when production is curtailed.

Demographic factors affecting separation rates

While some of the variation in separation rates is attributable to unique aspects of occupations, much of the variation is associated with the age, sex, and education of workers (table 6). Of course, often there is a relationship between the unique characteristic of an occupation and the type of workers employed in it. For example, occupations such as news vendor are generally filled by young workers who work part time while in school.

Age. Age is the dominant factor affecting occupational separations. The total separation rate has a U-shaped pattern: The rate is highest for persons age 16 to 19 (44 percent in 1983-84), lowest for persons age 45-54 (10 percent), and then increases as older persons stop working. A much different pattern is evident in the separation rates of persons who transfer to other occupations or become unemployed. In both cases, the rates are highest in the youngest age group and decline to their lowest point in the oldest group.

Sex. Total separation rates for men and women differed primarily as a result of significantly higher labor force separation rates for women between the ages of 20 and 54 (table 6). The occupational transfer rates for men and women were almost equal and declined consistently with age, as was the case for those who became unemployed.

Education. Although education does not alter the patterns of separation by age, it does affect their magnitude. The total separation rate declined from 23 percent for those without a high school diploma to 12 percent for college graduates. This difference results from the impact of education on the likelihood of becoming unemployed or leaving the labor force. For persons with less than a high school education, the rates for movement to unemployment and out of the labor force were 5 and 12 percent, respectively. Comparable rates for college graduates were 1 and 4 percent. Transfer rates were about the same for those having the least and the most education, while those in between were slightly higher. However, the patterns within all education groups were similar: Rates of transfer to other occupations or of becoming unemployed declined with age; labor force separation rates declined, then increased with age; and the labor force separation rate for prime-age women was higher than that for men.

Table 6. Occupational separation rates by education, age, and sex, 1983-84

(Percent)

Level of education and age	Separation rates, 1983-84[1]											
	Total			Transfers to other occupations			Movement to unemployment			Labor force separations		
	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women
Total, all levels of education	17.8	15.7	20.6	8.0	7.9	8.2	2.8	2.9	2.6	7.0	4.9	9.8
Age 16 - 19	43.9	42.6	45.3	20.5	20.0	20.9	6.5	7.2	5.7	17.0	15.4	18.7
Age 20 - 24	31.4	31.8	31.2	18.9	20.6	17.2	4.7	5.4	3.9	7.8	5.8	10.1
Age 25 - 34	17.8	14.8	21.5	10.4	10.5	10.3	2.8	2.9	2.8	4.5	1.5	8.4
Age 35 - 44	12.4	9.6	15.8	6.3	5.9	6.8	2.4	2.5	2.2	3.7	1.3	6.8
Age 45 - 54	10.2	8.3	12.7	4.0	4.1	3.9	2.1	2.2	1.9	4.1	2.1	6.9
Age 55 - 64	15.9	15.0	17.2	2.8	2.6	3.0	1.9	2.1	1.6	11.2	10.3	12.6
Age 65 - 74	28.6	28.1	29.4	1.5	1.4	1.6	.8	.7	.9	26.4	26.1	26.9
Age 75 and over	34.6	32.6	38.2	.3	.5	.0	.2	.3	.0	34.1	31.8	38.2
Not a high school graduate	23.2	21.3	26.1	6.6	6.7	6.5	4.5	4.8	3.9	12.1	9.8	15.6
Age 16 - 19	44.7	42.6	47.2	15.8	15.5	16.2	7.2	7.9	6.4	21.7	19.3	24.6
Age 20 - 24	37.0	36.0	39.2	18.1	19.1	16.0	8.8	10.1	5.8	10.2	6.8	17.4
Age 25 - 34	21.2	18.0	26.6	9.4	9.1	9.9	5.8	6.2	5.1	6.0	2.7	11.6
Age 35 - 44	17.1	14.4	20.7	6.9	7.1	6.6	4.3	4.7	3.8	5.8	2.6	10.3
Age 45 - 54	12.9	11.1	16.0	4.2	4.4	4.0	3.2	3.4	2.9	5.5	3.3	9.1
Age 55 - 64	18.9	18.6	19.5	2.7	2.8	2.6	3.0	3.3	2.5	13.2	12.6	14.4
Age 65 - 74	33.2	33.2	33.2	1.4	.7	2.4	.8	.4	1.3	31.0	32.1	29.5
Age 75 and over	36.5	35.0	39.1	.7	1.0	.0	.2	.3	.0	35.7	33.8	39.1
High school graduate	18.0	16.3	19.8	8.6	9.2	8.0	3.0	3.2	2.8	6.4	3.9	9.0
Age 16 - 19	44.2	45.1	43.6	28.3	30.0	26.9	6.2	7.0	5.5	9.7	8.2	11.3
Age 20 - 24	30.2	31.2	29.7	19.4	23.1	15.8	4.8	5.2	4.4	6.0	2.9	9.5
Age 25 - 34	19.1	15.8	22.9	10.8	11.1	10.3	3.4	3.3	3.5	4.9	1.4	9.1
Age 35 - 44	12.6	10.0	15.2	6.1	5.9	6.2	2.5	2.7	2.3	4.1	1.4	6.7
Age 45 - 54	10.2	8.7	11.9	3.9	4.2	3.5	2.1	2.4	1.7	4.3	2.1	6.7
Age 55 - 64	15.7	15.2	16.1	2.7	2.5	2.9	1.7	1.8	1.5	11.3	10.9	11.7
Age 65 - 74	28.5	29.4	27.5	1.7	1.9	1.5	.8	.6	.9	26.0	26.9	25.1
Age 75 and over	37.6	36.4	39.4	.0	.0	.0	.5	.8	.0	37.0	35.6	39.4
Some college education	18.5	15.8	21.8	9.1	8.8	9.4	2.5	2.5	2.4	7.0	4.5	9.9
Age 16 - 19	48.0	39.6	51.8	26.0	15.7	31.3	3.8	4.1	3.6	18.2	19.8	16.9
Age 20 - 24	30.9	30.9	31.0	16.9	16.9	16.9	3.6	4.2	3.1	10.4	9.7	11.0
Age 25 - 34	18.0	15.2	21.6	10.6	11.3	9.8	2.4	2.4	2.5	5.0	1.5	9.3
Age 35 - 44	13.0	9.7	17.1	7.2	6.3	8.2	2.4	2.4	2.4	3.5	1.1	6.5
Age 45 - 54	10.2	7.0	14.4	4.1	3.4	5.0	1.9	1.8	2.2	4.2	1.9	7.2
Age 55 - 64	15.6	13.4	19.0	3.0	3.0	2.9	1.3	1.4	1.0	11.4	9.0	15.1
Age 65 - 74	26.3	26.2	26.5	1.3	2.4	.0	1.3	1.6	1.0	23.6	22.2	25.5
Age 75 and over	27.3	25.3	30.5	.0	.0	.0	.0	.0	.0	27.3	25.3	30.5
College graduate	12.4	10.1	16.3	7.3	6.3	8.8	1.3	1.3	1.2	3.9	2.4	6.2
Age 16 - 19	40.6	40.6	.0	.0	.0	.0	.0	.0	.0	40.6	40.6	.0
Age 20 - 24	35.5	32.3	38.0	25.6	21.7	28.8	3.6	4.1	3.2	6.3	6.5	6.1
Age 25 - 34	14.6	12.1	17.9	10.2	9.6	10.9	1.3	1.4	1.2	3.1	1.1	5.8
Age 35 - 44	9.3	7.1	13.2	5.8	5.2	6.9	1.2	1.3	1.1	2.2	.6	5.2
Age 45 - 54	7.1	6.0	9.7	4.1	4.0	4.3	1.0	1.0	1.1	2.1	1.0	4.3
Age 55 - 64	11.5	10.4	14.2	2.8	2.4	3.7	1.0	1.2	.6	7.6	6.8	9.8
Age 65 - 74	21.1	19.0	27.2	1.3	1.4	1.1	.4	.5	.0	19.4	17.1	26.1
Age 75 and over	32.1	27.9	41.2	.0	.0	.0	.0	.0	.0	32.1	27.9	41.2

[1] The occupational separation rate is the percentage of individuals previously employed in an occupation who are not employed in that same occupation a year later. Occupational transfers occur if individuals remain employed, but in a different occupation. Separations exclude deaths.

NOTE: Due to rounding, individual items may not add to totals.

SOURCE: Merged Current Population Survey data. The methodology used to develop the data is presented in "New Occupational Data Improve Replacement Estimates," *Monthly Labor Review*, March 1984.

Permanent labor force separations

The gross separation data presented above can be used to identify occupations that will have large numbers of job openings due to replacement needs. By permitting comparisons of separation rates among occupations, the data also provide relative measures of the occupational attachment of workers. However, this information is not sufficient to establish training requirements. First, many of the workers who leave may later return to the occupation. Some will return after having been employed in

another occupation and some after not working for a period of time. In addition, many jobs are filled by workers who obtain their job skills through experience in other occupations rather than through institutional training. It is difficult to determine, therefore, the number of workers who will have to acquire their skills in a training program. However, for planning education and training programs, some estimate of minimum training requirements based on replacement needs arising from permanent labor force separations can be valuable.

There have been several efforts to develop estimates of permanent labor force separations, but all have had weaknesses. Most estimates have been based on tables of working life. Developed from labor force participation rates, these tables estimate the proportion of workers in any demographic group who can be expected to remain in the labor force over some future period. However, this methodology has signficant limitations.[5]

Estimates of permanent labor force separations could conceivably be developed from CPS gross separation data by occupation. For example, the difference between the number of workers age 55 and older leaving an occupation and those entering, the "net labor force separations of persons age 55 and older," could provide an occupation-specific annual measure of permanent separations. However, inconsistencies in the data attributable to sample size constraints preclude the use of this methodology.[6] Moreover, data developed from such flows are especially sensitive to economic conditions and may not be suitable for general application.

Another alternative, illustrated below, is to use currently available information about the age distribution of workers in detailed occupations. For example, most workers in an occupation who are age 55 and older, and some below the age of 55, will not be working 10 years from now. These data can be used to estimate permanent separations by occupation.

As shown in table 7, in 1984, 14.9 million persons in the labor force were 55 years of age or older. In 1994, 12.4 million of that group, 83 percent, are expected to have left the labor force, and it is likely that, soon after 1994, many of the remainder will leave the labor force. In addition, many of those remaining are likely to be working part time. The number of workers who are over 55, therefore, is a reasonable approximation of the minimum number of workers who will not be in the labor force in 1995.

Table 7. Civilian labor force, 1984, and projected declines by age group, 1984-94

Age in 1984	Civilian labor force, 1984	Decline in labor force, 1984-94	
		Number	Percent of 1984 civilian labor force
Total, age 16 and over	113,544	(1)	(1)
Age 16 - 24	23,987	(1)	(1)
Age 25 - 54	74,662	7,156	9.6
25 - 34	32,722	(1)	(1)
35 - 44	24,933	887	3.6
45 - 54	17,007	6,269	36.9
45 - 49	8,975	2,136	23.8
50 - 54	8,032	4,133	51.5
Age 55 and over	14,889	12,363	83.0
55 - 64	11,961	9,866	82.5
65 - 74	2,489	2,059	82.7
75 and over	438	438	100.0

[1] No decline.
SOURCE: Bureau of Labor Statistics.

In addition, we know that some younger workers also will leave the labor force permanently. Some will retire as soon as they are eligible, while others will leave because of illness or other reasons. Table 7 shows that about 4 million or 52 percent of the workers between 50 and 54 years of age in 1984, and about 2 million or 24 percent of those age 45-49, will also have left the labor force by 1994. Further, relatively small numbers of workers of other ages will die or leave the labor force permanently because of serious illness or because they have another means of support and do not desire to work.

As shown in table 8, 14 percent of all workers were age 55 and older in 1984, but the proportion varied significantly by occupational group. Private household workers (28 percent) and farming, forestry, and fishing occupations (22 percent) had the highest proportions, while technicians and related support occupations (8 percent) and handlers, equipment cleaners, helpers, and laborers (8 percent) had the lowest. All other groups were relatively close to the average. It is not unexpected that technicians and laborers have a low proportion of workers 55 and over, since many young people enter the labor market in these occupations and then, after acquiring work experience and training, advance to occupations that require greater skills.

Highly educated workers generally have a stronger attachment to the labor force than other workers. While occupations requiring highly trained workers might be expected to have larger proportions of workers age 55 and over, education or training is not the only factor

[5] Differences in separation rates among occupations were determined solely by occupational differences in age and sex distributions. In addition, significant distortions occurred when the sex and age distribution of employees in an occupation differed significantly from the population. For example, the proportion of physicians age 65 and older is much higher than that for the population. When the high separation rate for that age group was weighted by the number of older physicians, an overstatement of labor force separations resulted. See *Occupational Projections*, 1982 edition, pp. 72-73.

[6] For example, the net separation rate for elementary school teachers age 55 and older was 1.8 percent in 1977-78, 1.5 percent in 1980-81, and 0.9 percent in 1983-84. Although the absolute differences are relatively small, the percentage differences are significant.

Table 8. Age distribution for occupational groups, 1984

(Percent)

Occupational group	Total	Percent of employees										
		Age 16-24			Age 25 - 54					Age 55 and older		
		Total	16-19	20-24	Total	25-34	35-44	45-49	50-54	Total	55-64	65 and older
Total employed, age 16 and over	100.0	19.7	6.2	13.5	66.7	28.8	22.4	8.1	7.3	13.6	10.9	2.7
Executive, administrative, and managerial	100.0	7.5	.6	6.9	76.6	28.2	28.7	10.4	9.3	15.9	13.0	2.9
Professional specialty	100.0	8.1	.8	7.3	79.0	34.0	28.7	8.7	7.6	13.0	10.2	2.7
Technicians and related support	100.0	16.7	1.4	15.4	75.6	40.9	22.6	7.2	4.9	7.6	6.6	1.0
Sales occupations	100.0	24.9	9.9	14.9	60.5	25.4	20.5	7.5	7.0	14.6	11.1	3.5
Administrative support, including clerical	100.0	21.4	5.0	16.3	65.9	28.9	21.8	7.9	7.3	12.7	10.5	2.2
Private household occupations	100.0	31.5	20.6	10.9	40.9	14.1	13.0	6.3	7.6	27.5	17.9	9.6
Service workers, except private household	100.0	31.5	13.9	17.6	54.7	24.1	17.8	6.5	6.3	13.8	10.3	3.5
Farming, forestry, and fishing	100.0	24.3	11.3	13.1	53.6	22.5	16.6	7.5	7.0	22.1	14.1	8.0
Precision production, craft, and repair	100.0	15.8	3.1	12.7	71.5	32.4	22.8	8.7	7.7	12.7	10.9	1.8
Machine operators, assemblers, and inspectors	100.0	18.7	4.1	14.6	68.6	30.1	22.6	8.4	7.4	12.7	11.2	1.5
Transportation and material moving occupations	100.0	15.8	3.4	12.5	70.9	30.0	23.2	9.5	8.1	13.3	11.6	1.7
Handlers, equipment cleaners, helpers, and laborers	100.0	43.5	19.3	24.2	48.6	24.8	13.8	5.1	4.8	7.9	6.6	1.3

NOTE: Due to rounding, individual items may not add to totals. SOURCE: Current Population Survey.

keeping older workers in the labor market. Many workers may not have qualified for a retirement program and may not be able to afford to retire and maintain an adequate standard of living. In many other cases, social contacts and pleasure derived from continued work undoubtedly dominate economic considerations.

The 25 occupations with the highest proportions of workers age 55 and older are listed below. (Appendix table C-2 presents age distribution data for detailed occupations.[7]) The proportions range from 40 percent for dressmakers to 20 percent for sales workers in hardware and building supplies. The list includes physicians, dentists, and other highly trained workers but also janitors and taxicab drivers, occupations that do not require formal training.

Occupations with the highest proportions of workers age 55 and over

Dressmakers
Private household cleaners and servants
Farmers, except horticultural
Construction inspectors
Barbers
Managers, properties and real estate
Dentists
Welfare service aides
Clergy
Librarians
Real estate sales occupations
Guards and police, except public service
Authors
Management analysts
Personal service occupations, n.e.c.
Physicians
Supervisors, cleaning and building service workers
Janitors and cleaners
Grader, dozer, and scraper operators
Taxicab drivers and chauffeurs
Stationary engineers
Geologists and geodesists
Aerospace engineers
Adminstrators and officials, public administration
Sales workers, hardware and building supplies

Comparisons with other separation data. Estimates of permanent labor force separations based on the proportion of workers age 55 and older are lower than the estimates based on labor force separation rates shown in table 5. The latter include individuals leaving to transfer to other occupations and those leaving the labor force temporarily to return to school or to care for families and thus reflect a much larger number of separations.

Until 1982, BLS used worklife tables to estimate occupational labor force separations. These data estimated the "annual rates at which people withdraw from the labor force to retire or because of family responsibility or death.[8] Women leaving the labor force due to childbirth were included in the rates as a separate category. Since many young women return to the labor force when their children become older, their separation rate was not consistent with the concept of permanent separations; as a result, separations for women and

[7] Data for occupations with fewer than 100,000 employees are available from the Division of Occupational Outlook.

[8] Dixie Sommers and Carin Cohen, "New Occupational Rates of Labor Force Separation," *Monthly Labor Review*, March 1980, p. 36; and Dixie Sommers, "1984 National Separation Rates for Census-based Occupations" (unpublished memorandum, Bureau of Labor Statistics, November 1, 1978).

overall separations were overstated. Over a 10-year period, the estimate of total separations based on these worklife tables would be about twice that derived from the number of persons age 55 and older.

New worklife tables developed by BLS use matched CPS data, rather than the labor force participation rates used previously, to measure actual labor force separations and accessions.[9] Estimates of labor force separations by sex and age developed for the new worklife tables are much higher than estimates based on the earlier tables but are quite close to the labor force separation data presented in table 5. If labor force separation and accession data from the new worklife table are combined to identify sex and age groups in which labor force separation rates exceed accession rates, "net labor force separation rates" result. These rates are lower than previously published rates because female separations due to childbirth are no longer treated as a separate category.

[9] Shirley J. Smith, "Revised Worklife Tables Reflect 1979-80 Experience," *Monthly Labor Review*, August 1985, pp 23-30.

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Chapter 4. How Workers Get Their Training

Knowledge of how workers in different occupations obtain training to qualify for their jobs and improve their skills is useful to counselors who assist clients in making decisions on careers. Such information also is helpful to educational institutions, government agencies, and employers in planning education and training programs. To learn more about occupational training, the Bureau of Labor Statistics, under a contract with the Employment and Training Administration of the U.S. Department of Labor, analyzed data collected by the Census Bureau in a supplement to the January 1983 Current Population Survey. Persons in the survey sample were asked, "Did you need specific skills or training to obtain your current job?" Those who responded "yes" were asked to identify the source or sources of the training from the following six categories: (1) A program in a high school or a postsecondary school, (2) a formal company program, (3) informal on-the-job training or experience in a previously held job or jobs, (4) the Armed Forces, (5) correspondence courses, and (6) informal training from a friend or relative or other experience unrelated to work.

The survey data indicated that almost 53.9 million or 55 percent of the 97.3 million persons employed in January 1983 needed specific training to qualify for their current jobs. School and informal on-the-job training (OJT) were by far the most common training sources. About 28 million workers obtained training to qualify for their job in school, and almost as many gained their skills on the job. Formal company programs were a source of training for more than 9 million workers. Relatively few workers acquired skills for their jobs from other sources, such as correspondence courses, the Armed Forces, or friends and relatives.

Among the 12 major occupational groups used to classify workers, training was most important for obtaining jobs in the professional and technical fields. About 93 percent of the workers in professional specialty occupations and 85 percent of those in technician and related support occupations indicated that they needed training to qualify for their jobs. Requirements also were relatively high for workers in the executive, administrative, and managerial group, and those in precision production, craft, and repair jobs. Training was necessary for 57 percent of the workers in administrative support occupations, which was slightly higher than the average of 55 percent for all occupations. In the remaining seven occupational groups, the proportion of workers who required training was lower than the average, ranging from 43 percent of the sales workers to 8 percent of the private household workers. Within occupational groups, there were large differences in training requirements for detailed occupations. In the administrative support group, for example, 88 percent of the stenographers indicated they needed training to qualify for their jobs compared to only 13 percent of the messengers. In the service worker group, training was reported as being required by 97 percent of the hairdressers, but by only 12 percent of the short-order cooks.

Professional specialty occupations, the second largest group in terms of total employment, accounted for almost 22 percent of all workers who required training to qualify for their job, and administrative support occupations, the largest group, accounted for 17 percent (table 9). Some of the detailed occupations in these groups accounted for significant proportions of the total by themselves (secretaries, 5.1 percent; elementary school teachers, 2.9 percent). (See appendix D, table D-1.) More than 14 percent of all workers who required training were in executive, administrative, and managerial occupations, and about the same proportion were in precision production, craft, and repair jobs. Sales occupations accounted for 9 percent of the training total; service occupations for about 8 percent; and machine operators, assemblers, and inspectors for about 5 percent. Although a very high proportion of the workers in technician and related support occupations required training, this occupational group was so small that it accounted for less than 5 percent of the total who required training.

Statistics from the survey should be regarded as indicators of general magnitude rather than precise measures for several reasons. In some cases, for example, people may have reported their occupation or the training required incorrectly. Indeed, small percentages of workers in occupations that obviously have strict educational requirements, such as dentist and physician, reported no need for training to get their jobs. Furthermore, because the information was obtained from the workers, it represents what they believe is the training required rather than what employers state is the training required for the job. Finally, since individuals were not

Table 9. Occupational distribution of workers who needed specific training to qualify for their jobs, 1983

Occupational group	Number who needed training (thousands)	Percent of—	
		Total employment in occupation	Total who needed training
Total, all occupational groups	53,890	55.4	100.0
Professional specialty occupations	11,797	92.6	21.9
Administrative support occupations, including clerical	9,157	56.8	17.0
Executive, administrative, and managerial occupations	7,738	71.4	14.4
Precision production, craft, and repair occupations	7,603	65.1	14.1
Sales occupations	4,867	43.4	9.0
Service workers, except private household	4,397	35.5	8.2
Machine operators, assemblers, and inspectors	2,742	37.0	5.1
Technicians and related support occupations	2,579	84.6	4.8
Transportation and material moving occupations	1,462	36.3	2.7
Farming, forestry, and fishing occupations	862	27.9	1.6
Handlers, equipment cleaners, helpers, and laborers	605	16.2	1.1
Private household occupations	81	8.3	.2

Note: Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

asked the type of training *most* needed to obtain their jobs, the relative importance can only be inferred by the frequency with which the type of training was identified. The prevalence of a particular kind of training in an occupation means it is a customary way of qualifying for the job, but does not necessarily mean it is the best way.

Sources of qualifying training

School training. Almost 29 percent of all persons employed in January 1983 qualified for their current jobs with training obtained from school programs. The proportion was higher than average in the following four occupational groups: Professional specialty workers, 82 percent; technicians and related support workers, 58 percent; executives, administrators, and managers, 43 percent; and administrative support workers, 33 percent. These four occupational groups represented almost four-fifths of all workers who used school training to get their jobs, but accounted for little more than two-fifths of total employment. Professional specialty occupations alone accounted for 37 percent of all workers who trained in school programs; administrative support occupations, 19 percent.

Workers who qualified for their jobs with training acquired in schools also were asked to identify one or more of the following five program categories from which the training was received: (1) High school vocational program, (2) private post-high school vocational program, (3) public post-high school vocational school program, (4) junior or community college or technical institute program, and (5) 4-year or longer college program.

College programs that lasted 4 years or longer provided qualifying training to more workers than all other types of schooling combined. About 16.1 million people or almost 17 percent of all workers qualified for their jobs through these programs. Workers in the professional specialty occupations represented 56 percent of the total, and two large occupations in this group—elementary and secondary school teachers—together accounted for almost 17 percent (table D-2). Executive, administrative, and managerial occupations represented 23 percent of those who needed college training, while administrative support and sales occupations each accounted for about 6 percent, and technician and related support jobs, almost 5 percent.

College programs were the most important source of training for workers in professional specialty occupations. About 70 percent of them qualified for their jobs through these programs, and the proportion was much higher for some detailed occupations in this group. Academic preparation usually was most important in professional fields that require a high degree of specialized and theoretical knowledge. College was a source of training for almost all workers in many of these fields, including physicians, lawyers, psychologists, elementary and secondary school teachers, and biological and life scientists. College generally was less important for workers in professional fields that require artistic talent and creative ability, such as photographers, designers, actors, and musicians. College programs were a source of qualifying training for 34 percent of the workers in the executive, administrative, and managerial group. Although an even larger percentage of the workers in the group had completed 4 or more years of college, those with degrees who did not say that college was necessary may have attributed their jobs to experience instead of education because advancement to many managerial positions requires years of work experience. About 25 percent of the workers in technician and related support groups obtained their jobs

through college training, and the proportion was much greater among dental hygienists, computer programmers, biological technicians, and clinical laboratory technologists and technicians.

Junior colleges and technical institutes were the source of qualifying training for almost 5 million persons or about 5 percent of all workers. Administrative support occupations led all other groups in the number of workers reporting this training, with 26 percent of the total, and secretaries alone accounted for almost 11 percent (table D-3). Another 18 percent were in professional specialties, a large proportion of whom were registered nurses. About 11 to 12 percent each were in technician and related support jobs; executive, administrative, and managerial occupations; and precision production, craft, and repair jobs.

The proportion of workers who used training from junior colleges and technical institutes to get their jobs was much higher than average in most technician and related support occupations. These schools provided qualifying training for almost two-fifths of the radiologic technicians and dental hygienists, one-third of the licensed practical nurses, and about one-fourth of the electrical and electronics technicians and clinical laboratory technologists and technicians. Junior colleges and technical institute programs also were major providers of training for some professional specialty occupations—almost one-half of the inhalation therapists and almost one-third of the registered nurses obtained qualifying training through these programs. Although these schools were not the most significant source of training for precision production, craft, and repair workers as a group, they were important for data processing equipment repairers and office machine repairers. Relatively large proportions of real estate sales workers and sales engineers also reported this training.

High school vocational programs were a source of qualifying training for 4.7 million persons or almost 5 percent of all workers. About 57 percent of the workers who used this training to obtain their jobs were in administrative support occupations (table D-4). Secretaries alone accounted for 28 percent of those who reported the training—a very large proportion considering that the occupation accounted for less than 4 percent of total employment. Typists represented over 6 percent of the workers who used this method of training, and bookkeepers and accounting and auditing clerks, about 7 percent. Workers in the precision production, craft, and repair occupational group accounted for almost 13 percent of those who qualified for their jobs through high school vocational programs. Many of them were automobile mechanics, carpenters, electricians, and machinists.

Workers in the administrative support group were more likely than those in other groups to get their jobs through training in high school vocational programs. More than 16 percent of the administrative workers acquired qualifying skills in these programs, which was about three times the proportion for all workers. High school programs were the principal source of training for two of the largest occupations in the group—secretary and typist. Over one-third of the secretaries and typists prepared for their jobs in high school vocational programs, as well as relatively large numbers of stenographers, personnel clerks, billing clerks, and bookkeepers and accounting and auditing clerks. These programs were significant sources of training for some occupations in the precision production, craft, and repair group, such as automobile mechanics and tool-and-die makers. In addition, about one-fourth of the drafters from the technician group reported this training.

Almost 2.1 million persons or 2.2 percent of all workers obtained the training required for their jobs in *private post-high school vocational programs.* About 24 percent of the total were in administrative support occupations; 21 percent were in service jobs, except private household; and 18 percent were in professional specialties (table D-5).

Although relatively few workers qualified for their jobs with private post-high school vocational training, it was important for some occupations. Almost one-half of the hairdressers, one-third of the barbers, and one-fifth of the radiologic technicians used training from these schools to get their jobs. It also was a significant source of training for workers in several other occupations, including registered nurses, personnel clerks, licensed practical nurses, stenographers, and real estate sales workers.

The number of workers who acquired the training to obtain their jobs in *public post-high school vocational programs* was even smaller than the number who acquired training through private vocational education. Fewer than 1.6 million persons or only 1.6 percent of all workers obtained their job skills in these programs. About 23 percent of those who used the training to qualify for their jobs were in administrative support occupations, and 18 percent were in precision production, craft, and repair jobs (table D-6).

Public post-high school vocational programs were one of the most important sources of job preparation for licensed practical nurses—about one-fourth of them used this training. It also was reported by many barbers, data processing equipment repairers, hairdressers, and heating, air-conditioning, and refrigeration mechanics.

Informal on-the-job training (OJT). About 27 million persons or 28 percent of all workers attributed the skills they needed to obtain their jobs to training acquired informally through previous employment, which was almost as many as the number who learned job skills in

school. Unlike other forms of training, OJT did not tend to be concentrated in particular occupations. The occupational distribution of workers who used it to qualify for their jobs was more like that of total employment than of workers who used any other type of training. Administrative support occupations accounted for about 18 percent of the workers who reported OJT. Another 17 percent were in precision production, craft, and repair jobs, while 16 percent were in executive, administrative, and managerial occupations, and 12 percent were in sales jobs (table D-7).

OJT was the most important source of training for such diverse occupations as legal assistants, upholsterers, editors and reporters, and plumbers—about 50 to 60 percent of the workers in these occupations learned their skills through OJT. Occupations in which relatively few workers used OJT to get jobs also were a very mixed group. Occupations with less than 10 percent of workers reporting this method included, for example, dentists, news vendors, elementary school teachers, and garbage collectors, which reflects the fact that in some cases school is about the only training necessary, while in others, little, if any, training is required.

Formal company training. About 9.4 million persons or almost 10 percent of all workers obtained their jobs with skills they learned in formal company (employer) training programs, such as apprenticeship. Precision production, craft, and repair occupations were ahead of all other groups in the number of workers reporting formal company training, with almost 21 percent of the total (table D-8). About 14 percent each were in sales occupations and executive, administrative, and managerial jobs, and about 13 percent each were in administrative support jobs and professional specialties.

The proportion of workers who qualified for their jobs through employer training programs was particularly high in some protective service occupations. Almost one-half of the public service police and detectives and two-fifths of the firefighters and correctional institution officers reported this training. Formal company programs also were reported frequently by workers in a variety of other occupations—office machine repairers, tool-and-die makers, insurance sales workers, and busdrivers—to name a few.

Training in the Armed Forces. Only 1.9 million persons or 2 percent of all workers received training in military service that provided them with the skills needed to get their jobs. Almost 32 percent of the workers who used this training were in the precision production, craft, and repair group (table D-9). Executive, administrative, and managerial occupations accounted for about 17 percent of the workers who used this training, and professional specialty jobs, 15 percent. Training in the military services was most important for aircraft engine mechanics—almost one-half of these workers acquired their skills in the service. The Armed Forces also were a source of skills for many data processing equipment repairers, electronics repairers of commercial and industrial equipment, electrical and electronics technicians, and aerospace engineers.

Correspondence schools. Correspondence courses were the least significant method of job training. Approximately three-quarter of a million persons obtained the skills they needed to qualify for their jobs through correspondence school training, which was less than 1 percent of all workers. About 24 percent were in precision production, craft, and repair jobs (table D-10). Another 18 percent were executive, administrative, and managerial workers, and about 15 percent each were sales workers and professional specialists.

More than one-tenth of the electronics repairers of communications and industrial equipment used correspondence school training to qualify for their jobs. In most other occupations, however, the proportion who reported this training was very small.

Other training. About 3.2 million persons or 3 percent of all workers got their training informally from a friend or relative or other experience unrelated to work. About 29 percent of all workers who reported this category of training were in precision production, craft, and repair jobs (table D-11). Workers in the following occupation groups each accounted for about 10 percent of the total: Executive, administrative, and managerial; farming, forestry, and fishing; professional specialty; and sales.

Almost one-third of the dressmakers qualified for their jobs by means of informal instruction from a friend or relative or other experience unrelated to work. This kind of training also was a source of skills for many musicians, photographers, carpenters, automobile mechanics, automobile body repairers, and farmers.

Occupational patterns

In analyzing the survey results it can be helpful to look at how frequently workers in an occupational category reported each source of training. Patterns of training differ greatly by occupational group. Workers in professional specialty occupations and technician and related support occupations identified school more frequently than all other sources of qualifying training combined. School also was more important than any other single source for administrative support workers and for executives, administrators, and managers. Workers in the following occupational groups reported OJT more frequently than all other training sources combined: Handlers, equipment cleaners, helpers, and laborers; transportation and material moving workers; and machine operators, assemblers, and inspectors. OJT also was the single most important source of qualifying

training for workers in the remaining occupational groups, except private household workers, who were more likely to learn from friends or relatives or other experience unrelated to work. Frequently, if school was the primary method of training for an occupational group, OJT was second, and vice versa.

The training patterns for some detailed occupations are common knowledge. It is not surprising, for example, that few physicians and dentists reported sources of qualifying training other than school. For many occupations, however, the relative importance of the different sources is less obvious. It would have been difficult to predict, for example, that secretaries were more likely to report high school vocational programs than informal on-the-job training or that computer programmers were more likely to report informal on-the-job training than formal company instruction.

Descriptions of patterns of qualifying training for more than 250 occupations are presented in *How Workers Get Their Training,* Bulletin 2226 (Bureau of Labor Statistics, 1985). This publication also contains data on skill improvement training.

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Chapter 5. Occupational Profiles

Chapter 2 provided an overview of the broad changes in employment projected for the 1984-95 period. This chapter presents detailed employment and supply profiles for the 200 or so occupations covered in the *1986-87 Occupational Outlook Handbook*. The occupations are listed alphabetically within the major occupational groupings that conform to the clustering arrangement of the *Handbook*, which is structured according to the *Standard Occupational Classification Manual, 1980 Edition*.

Each occupational description in this chapter presents, when available, the following information:

Employment profile

Total employment, 1984. Total employment includes wage and salary workers, the self-employed, and unpaid family workers. Occupational distribution patterns from the Occupational Employment Statistics (OES) surveys were used to develop the estimates of 1984 employment of wage and salary workers. Estimates for self-employed and unpaid family workers are based on data from the Current Population Survey (CPS).

Employment represents the number of jobs rather than a count of individuals. Because of economic necessity or personal desire, some people hold more than one job. About 5 percent of all workers are dual jobholders. Workers in some occupations, such as dental hygienist, may work for more than one employer because jobs are available only on a part-time basis.

For a detailed explanation of how the estimates were derived, see the section on occupational employment projections in *Employment Projections for 1995: Data and Methods*, BLS Bulletin 2253.

Selected characteristics of workers, 1984. Characteristics of workers are available only from the CPS. Although the CPS occupational classifications are not identical to those of the OES, many occupations are sufficiently comparable so that CPS data can provide a reasonable proxy. Such data, presented in this section for occupations with 1984 CPS employment of 50,000 or more, include the percentage of women, blacks, and part-time workers, including those working part time voluntarily, and the age distribution of workers.

Figure 1 presents data for these characteristics for employed workers as a whole. This information can be used, for example, to identify occupations with an above-average proportion of part-time jobs. (Part time is defined as fewer than 35 hours per week.) The number of workers who are 55 and older can be used as an approximation of the minimum number of workers who will die or permanently retire from the labor force in the next 10 years.

Figure 1. Characteristics of the employed, 1984

Percent female	43.7
Percent black	9.6
Age distribution (percent):	
16-24 years	19.7
25-54 years	66.7
55 and older	13.6
Percent employed part time, total	17.8
Percent employed part time, voluntary	12.8

Unemployment rate. For occupations with 100,000 or more workers, the unemployment rate, derived from CPS data, is compared with the average for all workers over the 1983-85 period, according to the definitions presented in figure 2.

Figure 2. Unemployment rate

If the average rate over the 1983-85 period was in the following range:	Unemployment was characterized as:
Up to 1st decile	Much lower than average
Between 1st and 3rd deciles	Lower than average
Between 3rd and 7th deciles	About average
Between 7th and 9th deciles	Higher than average
9th decile and above	Much higher than average

Industry concentration of wage and salary workers, 1984. This section lists all industries that accounted for 5 percent or more of the wage and salary jobs in the occupation in 1984. The source of these data is the 1984-95 National Industry-Occupation Employment Matrix. The matrix for 1984 presents, in percentage terms, the

distribution of over 500 occupations in 378 industries based on recent OES surveys.

Projected 1995 employment. This section presents the 1995 low-, moderate-, and high-growth projections of employment. The basic procedure used to develop the 1995 occupational projections for wage and salary workers was to project the staffing patterns in the matrix from 1984 to 1995 and then apply the projected patterns to projections of industry employment developed through the Bureau's economic growth system. The occupational structure for each industry was projected to 1995 through analyses of the factors that are expected to change the structure. The projected staffing patterns of industries used to translate industry employment into occupational employment were identical in all three alternatives. The different growth rates for occupations among the alternatives, therefore, reflect the assumptions and analyses that underlie the alternative industry employment projections. Self-employed and unpaid family workers were projected separately and added to the sum of wage and salary workers for all industries to derive the projections of total employment. For a description of how the projections were developed, see *Employment Projections for 1995*, Bulletin 2253.

Percent change, 1984-95. This identifies fast- and slow-growing occupations. For comparison purposes, the projected change in total employment between 1984 and 1995 is 14.9 percent.

Employment growth. The same adjectives used in the *1986-87 Occupational Outlook Handbook* are used here to describe how employment change projected for each occupation compares with the average for all occupations. Figure 3 shows the range of data the descriptive terms cover.

Figure 3. Change in employment between 1984 and 1995

If employment is projected to:	The statement about employment change reads:
Increase 31 percent or more	Much faster than average
Increase 20 to 30 percent	Faster than average
Increase 11 to 19 percent	About as fast as average
Increase 4 to 10 percent	Slower than average
Increase or decrease 3 percent	Little change
Decrease 4 percent or more	Decline

Annual separation rate (percent). This rate, derived from CPS data, is the proportion of workers—for occupations of 100,000 jobs or more—who left the occupation in 1983-84. This gross separation rate can be used to identify occupations that will have large numbers of job openings due to replacement needs. Occupations with relatively low separation rates tend to have high pay and status, lengthy training requirements, and a high proportion of prime-working-age, full-time workers. Occupations with high separation rates, on the other hand, generally are large, with low pay and status, low training requirements, and a high proportion of young and part-time workers. For more detailed information, see chapter 3.

Supply profile

Usual entry and training requirements. The requirements are stated in general terms and therefore may differ from those of specific employers. This section reflects information developed for the *1986-87 Occupational Outlook Handbook*, including data on how workers get their training, which was collected in a supplement to the January 1983 CPS. For additional information about this survey of occupational training, see chapter 4.

Training completions. This section, included for most occupations, presents available data on completions of appropriate formal education and training programs. Only programs with 100 or more completions are shown, except for Ph.D. programs, for which the minimum for presentation is 20. See appendix E for additional education and training statistics.

The data on completions of various programs can be useful in providing a measure of the significance of these sources of supply in relation to openings. However, comparing completions with openings to estimate shortages or surpluses is not recommended because, for most occupations, not all avenues of entry into an occupation are discernible. Those who complete education or training programs represent only a fraction of the total number of entrants to most occupations, as shown in chapter 3. Many openings arising from replacement needs, for example, are filled by individuals reentering occupations they left temporarily. Furthermore, not all persons who complete programs represent an addition to supply. Some never enter the labor force; some take training and education solely for personal enrichment, to upgrade skills in a present job, or for some other consideration.

Characteristics of entrants. This section briefly discusses the characteristics of entrants to occupations having comparable OES and CPS definitions, 1984 CPS employment of 50,000 or more, and consistent patterns of entry in periods for which CPS occupational mobility data are available. For some occupations, the description of entry characteristics reflects BLS analysts' knowledge of the occupations.

Executive, Administrative, and Managerial Occupations

Accountants and auditors

EMPLOYMENT PROFILE

Total employment, 1984 882,000

Selected characteristics of workers, 1984:

Percent female	40.9
Percent black	5.5
Age distribution (percent):	
16-24 years	13.3
25-54 years	75.1
55 and older	11.6
Percent employed part time, total	5.1
Percent employed part time, voluntary	4.3

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Accounting, auditing, and bookkeeping services	20.9
Manufacturing	15.1
Government	12.3
Finance, insurance, and real estate	10.4
Wholesale trade	9.1

	Low	*Moderate*	*High*
Projected 1995 employment	1,135,000	1,189,000	1,235,000
Percent change, 1984-95	28.7	34.8	40.1

Employment growth ..... Much faster than average

Annual separation rate (percent) 9.9

SUPPLY PROFILE

Usual entry and training requirements. Most public accounting and business firms require a bachelor's degree. For a few entry level positions, however, completion of a 1- or 2-year accounting program is adequate. A growing number of employers seek persons with a master's degree in accounting or a master's degree in business administration with a concentration in accounting.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Accounting, bookkeeping, and related programs	105,047
Private noncollegiate postsecondary, 1981:	
Accounting	19,880
Associate degrees and awards below baccalaureate, 1983:	
Accounting; and accounting, bookkeeping, and related programs	17,149
Earned degrees, baccalaureate and above, 1983:	
Accounting:	
Bachelor's	45,732
Master's	3,046
Ph.D.	66

Characteristics of entrants. Most entrants have completed at least some college training, and the majority are college graduates. About half of all entrants have not been working. The remainder transfer from another occupation; some are bookkeepers and accounting clerks advancing to accountant or auditor jobs.

Bank officers and managers

EMPLOYMENT PROFILE

Total employment, 1984 453,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Commercial and stock savings banks	62.4
Savings and loan associations	13.9
Personal credit institutions	9.9

	Low	*Moderate*	*High*
Projected 1995 employment	544,000	572,000	596,000
Percent change, 1984-95	20.2	26.3	31.8

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Experience as a management trainee or outstanding work as a bank clerk or teller is required for most starting bank officer and management positions. Management trainees usually must have a bachelor's degree in business administration with a major in finance, or in a liberal arts curriculum such as accounting, economics, commercial law, political science, or statistics. Some banks prefer trainees who have a master's degree in business administration (MBA). Bank officers often participate in company-sponsored training programs, take courses at local colleges and universities, and attend seminars and conferences to broaden their knowledge and skills.

Characteristics of entrants. Most entrants transfer from another professional or clerical occupation. The majority of entrants have had some college training and many are college graduates. Entrants are typically older than entrants to other occupations—reflecting the importance of work experience.

Construction and building inspectors

EMPLOYMENT PROFILE

Total employment, 1984 55,000

Selected characteristics of workers, 1984:

Percent female	3.5
Percent black	2.6
Age distribution (percent):	
16-24 years	6.3
25-54 years	62.5
55 and older	31.2
Percent employed part time, total	5.6
Percent employed part time, voluntary	4.6

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Local government	45.8
Special trade contractors	16.7
State government	11.0
Federal Government	9.5
General contractors and operative builders	7.7

	Low	*Moderate*	*High*
Projected 1995 employment	58,000	59,000	61,000
Percent change, 1984-85	4.4	7.4	10.0

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. A high school diploma and several years of experience are generally required for construction inspectors. Inspectors need a thorough knowledge of construction materials and practices in either a general area like heavy construction or a specialized area such as electrical or plumbing systems, reinforced concrete, or structural steel. Many employers prefer inspectors who have completed an apprenticeship program, studied engineering or architecture for at least 2 years, or earned a related associate degree from a community or junior college. To keep abreast of new building code developments, many inspectors participate in company- or State-sponsored training programs.

Characteristics of entrants. Most entrants transfer from another occupation—primarily craft worker, supervisor, or construction contractor—where they obtained the required experience. Thus, entrants tend to be older than entrants to other occupations.

Health services managers

EMPLOYMENT PROFILE

Total employment, 1984	336,000
Selected characteristics of workers, 1984:	
Percent female	61.2
Percent black	6.4
Age distribution (percent):	
16-24 years	3.0
25-54 years	80.7
55 and older	16.3
Percent employed part time, total	4.7
Percent employed part time, voluntary	4.2

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	45.1
Offices of physicians	18.6
Nursing and personal care facilities	14.4
Offices of dentists	6.2

	Low	*Moderate*	*High*
Projected 1995 employment	460,000	483,000	505,000
Percent change, 1984-95	36.9	43.6	50.1

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. A master's degree—in hospital administration, health administration, public health, or business administration—is the standard credential for hospital jobs and some other positions. All States require nursing home administrators to be licensed. Licensure requirements typically include 2 to 4 years of college and successful completion of a written examination that tests the applicants' knowledge of management principles and practices. Work experience is very important.

Training completions:

Earned degrees, baccalaureate and above, 1983:	
Health sciences administration and public health:	
Bachelor's	3,102
Master's	2,014
Ph.D.	34

Characteristics of entrants. Many entrants transfer from another occupation—primarily another health occupation. Some have worked in these while in graduate school. Other entrants are experienced workers who have been tending to family responsibilities or in school full time. Because of the emphasis placed on work experience and advanced education, entrants tend to be much older than entrants to other occupations.

Hotel managers and assistants

EMPLOYMENT PROFILE

Total employment, 1984	83,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hotels, motels, and tourist courts	98.4

	Low	*Moderate*	*High*
Projected 1995 employment	97,000	104,000	109,000
Percent change, 1984-95	17.8	25.7	32.3

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Although most employers will accept applicants without formal training who have previous work experience in this field, a growing number emphasize college or specialized postsecondary education.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Institutional management	2,290
Private noncollegiate postsecondary, 1981:	
Hotel and lodging	261
Associate degrees and awards below baccalaureate, 1983:	
Institutional management	2,692
Earned degrees, baccalaureate and above, 1983:	
Institutional management:	
Bachelor's	3,486
Master's	268

Inspectors and compliance officers, except construction

EMPLOYMENT PROFILE

Total employment, 1984	122,000
Selected characteristics of workers, 1984:	
Percent female	22.0
Percent black	12.2
Age distribution (percent):	
16-24 years	5.6
25-54 years	77.2
55 and older	17.2
Percent employed part time, total	3.1
Percent employed part time, voluntary	2.3

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
State government	31.4
Federal Government	27.8
Local government	24.9
Finance, insurance, and real estate	6.1

	Low	*Moderate*	*High*
Projected 1995 employment	129,000	131,000	134,000
Percent change, 1984-85	5.9	8.0	9.9

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Because these workers specialize in the inspection of items ranging from meat to mines to aircraft, they encompass a great diversity of detailed technical knowledge, background, and experience. Many jobs require a college degree in an engineering or scientific specialty, while others require experience in a related occupation. All inspectors must be trained in applicable laws and inspection procedures through a combination of classroom and on-the-job training.

Characteristics of entrants. Entrants typically transfer from another occupation where they have obtained the required experience or enter directly from school. Consequently, these workers tend to be older than other entrants. Many entrants have completed some form of postsecondary training.

Personnel, training, and labor relations specialists

EMPLOYMENT PROFILE

Total employment, 1984 198,000

Selected characteristics of workers, 1984:

Percent female	55.5
Percent black	11.7
Age distribution (percent):	
16-24 years	6.6
25-54 years	82.2
55 and older	11.2
Percent employed part time, total	5.7
Percent employed part time, voluntary	4.7

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Durable goods manufacturing	14.8
Federal Government	12.9
Membership organizations	12.4
Finance, insurance and real estate	8.4
Nondurable goods manufacturing	6.4
Comunications and utilities	5.8
State government	5.5

	Low	*Moderate*	*High*
Projected 1995 employment	223,000	232,000	240,000
Percent change, 1984-95	12.6	17.3	21.2

Employment growth ..... Average

Annual separation rate (percent) 14.8

SUPPLY PROFILE

Usual entry and training requirements. Firms seek college graduates for entry level jobs but have varying preferences as to field of study. Some employers prefer applicants who have majored in personnel administration, human resource development, or labor relations; others require a technical or business background; and some hire liberal arts graduates. Regardless of academic background, employers stress the importance of prior work experience and continuing education and training.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Personnel management and labor and industrial relations:	
Bachelor's	3,316
Master's	1,145

Characteristics of entrants. People who take jobs in this field frequently transfer from another occupation. Entrants tend to be older than entrants to other occupations, and many openings are filled by individuals over the age of 35. Entrants who have not been working fill the remainder of the openings. For the most part, they have been in school or between jobs. Many entrants are college graduates.

Purchasing agents

EMPLOYMENT PROFILE

Total employment, 1984 189,000

Selected characteristics of workers, 1984:

Percent female	22.6
Percent black	1.8
Age distribution (percent):	
16-24 years	8.2
25-54 years	75.5
55 and older	16.3
Percent employed part time, total	2.3
Percent employed part time, voluntary	1.9

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Durable goods manufacturing	33.8
Federal Government	15.1
Business services	8.5
Nondurable goods manufacturing	8.3

	Low	*Moderate*	*High*
Projected 1995 employment	216,000	225,000	232,000
Percent change, 1984-95	14.7	19.1	22.9

Employment growth ..... Average

Annual separation rate (percent) 12.3

SUPPLY PROFILE

Usual entry and training requirements. There are no universal educational requirements for entry level jobs. Many smaller companies promote clerks or technicians in the purchasing department or hire graduates of associate degree programs in purchasing. Some small companies and most large organizations require a college degree and prefer applicants with a master's degree in business administration or management. Certification—the sign of professional competence—requires several years of experience and extensive continuing education.

Training completions:

Associate degrees and other awards below baccalaureate, 1983:

Business and management, general; contract management and procurement/purchasing; and purchasing	14,262

Earned degrees, baccalaureate and above, 1983:

Business and management, general; contract management and procurement/purchasing; and purchasing:	
Bachelor's	42,543
Master's	11,944
Ph.D.	164

Characteristics of entrants. Most entrants transfer from another occupation—many of these are administrative and technical workers in the purchasing department who move up the career ladder and others who have specialized knowledge of particular products or services. The remaining entrants have not been working—many have been in school. Entrants tend to be considerably older than entrants to other occupations.

School principals and assistant principals

EMPLOYMENT PROFILE

Total employment, 1984 125,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	100.0

	Low	*Moderate*	*High*
Projected 1995 employment	133,000	137,000	142,000
Percent change, 1984-95	6.9	10.0	13.6

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require certification for those in public schools; certification requirements usually include graduate training in education administration, teaching experience, and passing an examination. Applicants should have leadership and communications skills as well as managerial ability.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Education administration, general; administration of special education; adult and continuing education administration; educational supervision; elementary and secondary education administration; and education administration, other:	
Master's	9,475
Ph.D.	1,511

Characteristics of entrants. The typical entrant transfers from a teaching position or an administrative job such as curriculum specialist or financial officer. Many of the remaining entrants are former school administrators who have been tending to family responsibilities. Because of the extensive education and experience required, entrants tend to be older than entrants to other occupations.

Underwriters

EMPLOYMENT PROFILE

Total employment, 1984 78,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Insurance agents, brokers, and services	41.5
Fire, marine, and casualty insurance	40.9
Life insurance	13.2

	Low	*Moderate*	*High*
Projected 1995 employment	90,000	95,000	100,000
Percent change, 1984-95	15.4	22.1	27.4

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Most large insurance companies prefer college graduates who have a degree in liberal arts or business administration, but a major in almost any field provides a good general background. Some small companies hire persons without a college degree for trainee positions. Some experienced underwriting clerks are promoted to underwriter positions. Entrants need the ability to work with detail and to communicate effectively. Continuing education is very important for those wishing to advance.

Wholesale and retail buyers

EMPLOYMENT PROFILE

Total employment, 1984 229,000

Selected characteristics of workers, 1984:

Percent female	42.2
Percent black	3.1
Age distribution (percent):	
16-24 years	12.4
25-54 years	73.5
55 and older	14.1
Percent employed part time, total	8.5
Percent employed part time, voluntary	7.2

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Wholesale trade, durable goods	22.9
General merchandise stores (includes department and variety stores)	15.2
Miscellaneous retail stores (includes drug, proprietary, liquor, used merchandise, and related stores)	14.2
Wholesale trade, nondurable goods	13.7
Food stores	11.3
Apparel and accessories stores	10.9

	Low	*Moderate*	*High*
Projected 1995 employment	244,000	258,000	269,000
Percent change, 1984-95	6.4	12.4	17.2

Employment growth ..... Average

Annual separation rate (percent) 13.9

SUPPLY PROFILE

Usual entry and training requirements. Familiarity with merchandise and with wholesaling and retailing generally is required. Experience is most often gained as an assistant buyer or buyer trainee. Trainees acquire skills through formal classroom instruction and on-the-job training. High school and postsecondary marketing and distributive education programs can lead to one of these entry positions. However, most employers prefer either to hire college graduates with a major in marketing or purchasing or to promote employees from within the organization.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Contract management and procurement/purchasing and marketing management:
  - Bachelor's 23,832
  - Master's 2,000
  - Ph.D. 22

Characteristics of entrants. The majority of entrants transfer from another occupation. The remaining entrants have not been working—most have been in school, retired, or tending to family responsibilities. Because of the importance of work experience, entrants tend to be older than entrants to other occupations. The majority of entrants have had some college training.

Engineers, Surveyors, and Architects

Architects

EMPLOYMENT PROFILE

Total employment, 1984 93,000

Selected characteristics of workers, 1984:
- Percent female 10.8
- Percent black 2.4
- Age distribution (percent):
  - 16-24 years 6.2
  - 25-54 years 81.6
  - 55 and older 12.2
- Percent employed part time, total 5.0
- Percent employed part time, voluntary 3.9

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Engineering, architectural, and surveying services	67.5
Agricultural services	12.1
Federal Government	5.7

	Low	*Moderate*	*High*
Projected 1995 employment	113,000	118,000	122,000
Percent change, 1984-95	21.3	27.0	31.2

Employment growth ..... Faster than average

Annual separation rate (percent) 6.0

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require individuals to be registered before they may call themselves architects or contract for architectural services. To qualify for the registration examination, applicants generally need at least a Bachelor of Architecture degree from an accredited program and 3 years of experience working for an architect.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Architecture:
  - Bachelor's 4,587
  - Master's 1,630
  - Ph.D. 26

Characteristics of entrants. Most entrants have not been working—most have been in school and some are architects who were between jobs. A few are experienced workers transferring from another occupation. Because of extensive educational and training requirements, entrants tend to be older than those of most other occupations.

Engineers

EMPLOYMENT PROFILE

Total employment, 1984 1,331,000

Selected characteristics of workers, 1984:
- Percent female 6.2
- Percent black 2.6
- Age distribution (percent):
  - 16-24 years 7.9
  - 25-54 years 77.3
  - 55 and older 14.8
- Percent employed part time, total 1.5
- Percent employed part time, voluntary 1.3

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Electrical and electronic machinery and equipment manufacturing	14.1
Transportation equipment manufacturing	13.0
Engineering, architectural, and surveying services	10.4
Machinery manufacturing, except electrical	10.2
Federal Government	7.2
Nondurable goods manufacturing	6.8

	Low	*Moderate*	*High*
Projected 1995 employment	1,734,000	1,811,000	1,877,000
Percent change, 1984-95	30.3	36.1	41.0

Employment growth ..... Much faster than average

Annual separation rate (percent) 8.6

SUPPLY PROFILE

Usual entry and training requirements. A bachelor's degree in engineering is generally required for beginning engineering jobs. College graduates with a degree in science or mathematics and experienced technicians may also qualify for some jobs. Many engineers obtain a master's degree, which is desirable for promotion

or for learning new technologies. To keep up with rapid advances in technology, engineers must continue their education and training throughout their career.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Engineering; engineering and engineering-related technologies:	
Bachelor's	89,199
Master's	19,350
Ph.D.	2,831

Characteristics of entrants. About half of all entrants have not been working; they are either experienced engineers who were between jobs or recent college graduates. The remaining entrants transfer; many are from a closely related occupation. Most entrants have a college degree and are 20 to 34 years of age.

Aerospace engineers

EMPLOYMENT PROFILE

Total employment, 1984	48,000
Selected characteristics of workers, 1984:	
Percent female	3.3
Percent black	4.2
Age distribution (percent):	
16-24 years	11.7
25-54 years	67.5
55 and older	20.8
Percent employed part time, total	1.0
Percent employed part time, voluntary	1.0

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Aircraft and parts manufacturing	57.7
Federal Government	17.6
Business services	6.9

	Low	*Moderate*	*High*
Projected 1995 employment	60,000	62,000	64,000
Percent change, 1984-95	24.6	29.5	32.9

Employment growth ..... Faster than average

Chemical engineers

EMPLOYMENT PROFILE

Total employment, 1984	56,000
Selected characteristics of workers, 1984:	
Percent female	8.9
Percent black	2.2
Age distribution (percent):	
16-24 years	8.9
25-54 years	74.7
55 and older	16.4
Percent employed part time, total	.9
Percent employed part time, voluntary	.7

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Chemical and allied products manufacturing	31.0
Durable goods manufacturing	17.6
Miscellaneous services (includes engineering, architectural, and surveying services)	10.2
Business services	9.2
Petroleum refining and related industries	7.7

	Low	*Moderate*	*High*
Projected 1995 employment	66,000	69,000	72,000
Percent change, 1984-95	18.0	23.9	29.0

Employment growth ..... Faster than average

Civil engineers

EMPLOYMENT PROFILE

Total employment, 1984	175,000
Selected characteristics of workers, 1984:	
Percent female	6.1
Percent black	1.0
Age distribution (percent):	
16-24 years	9.0
25-54 years	76.6
55 and older	14.4
Percent employed part time, total	1.8
Percent employed part time, voluntary	1.6

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Engineering, architectural, and surveying services	31.8
State government	18.1
Local government	12.8
Federal Government	11.2
Construction	9.1

	Low	*Moderate*	*High*
Projected 1995 employment	214,000	222,000	229,000
Percent change, 1984-95	22.1	26.5	30.5

Employment growth ..... Faster than average

Annual separation rate (percent) 5.0

Electrical and electronics engineers

EMPLOYMENT PROFILE

Total employment, 1984	390,000
Selected characteristics of workers, 1984:	
Percent female	7.1
Percent black	4.0
Age distribution (percent):	
16-24 years	7.9
25-54 years	79.3
55 and older	12.8
Percent employed part time, total	1.5
Percent employed part time, voluntary	1.3

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Electrical and electronic machinery and equipment manufacturing	30.2
Machinery manufacturing, except electrical	12.3
Communications and utilities	10.7
Government	8.2
Business services	7.7
Miscellaneous services (includes engineering, architectural and surveying services)	7.2

	Low	Moderate	High
Projected 1995 employment	571,000	597,000	617,000
Percent change, 1984-95	46.3	52.8	58.1

Employment growth ..... Much faster than average

Annual separation rate (percent) 5.2

Industrial engineers

EMPLOYMENT PROFILE

Total employment, 1984 125,000

Selected characteristics of workers, 1984:

Percent female	9.3
Percent black	2.4
Age distribution (percent):	
16-24 years	5.6
25-54 years	80.4
55 and older	14.0
Percent employed part time, total	.6
Percent employed part time, voluntary	.4

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Machinery manufacturing, except electrical	18.3
Transportation equipment manufacturing	16.9
Electrical and electronic machinery and equipment manufacturing	16.5
Nondurable goods manufacturing	11.8
Services	6.8

	Low	Moderate	High
Projected 1995 employment	154,000	162,000	168,000
Percent change, 1984-95	23.4	29.4	34.7

Employment growth ..... Faster than average

Annual separation rate (percent) ..... [1]15.4

[1] The number of separations may be artificially high. Employment in the occupation declined between 1983 and 1984; some workers who left were not replaced.

Mechanical engineers

EMPLOYMENT PROFILE

Total employment, 1984 237,000

Selected characteristics of workers, 1984:

Percent female	4.9
Percent black	2.2
Age distribution (percent):	
16-24 years	7.6
25-54 years	75.2
55 and older	17.2
Percent employed part time, total	1.6
Percent employed part time, voluntary	1.5

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Machinery manufacturing, except electrical	17.6
Engineering, architectural, and surveying services	13.7
Transportation equipment manufacturing	11.2
Nondurable goods manufacturing	9.6
Electrical and electronic machinery and equipment manufacturing	9.1
Fabricated metal products manufacturing	6.9

	Low	Moderate	High
Projected 1995 employment	303,000	317,000	329,000
Percent change, 1984-95	28.0	34.0	39.2

Employment growth ..... Much faster than average

Annual separation rate (percent) 8.5

Metallurgical, ceramic, and materials engineers

EMPLOYMENT PROFILE

Total employment, 1984 19,000

Industry concentration of wage and salary workers, 1984

Industry	Percent
Primary metal manufacturing	22.6
Transportation equipment manufacturing	17.8
Electrical and electronic machinery and equipment manufacturing	9.3
Business services	9.0
Machinery manufacturing, except electrical	8.4

	Low	Moderate	High
Projected 1995 employment	22,000	23,000	25,000
Percent change, 1984-95	16.7	22.8	29.2

Employment growth ..... Faster than average

Mining engineers

EMPLOYMENT PROFILE

Total employment, 1984 7,200

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Bituminous coal and lignite mining	30.5
Metal mining	12.7
Oil and gas extraction	11.3
Federal Government	8.5
Nonmetallic mining and quarrying	7.7
Engineering, architectural, and surveying services	7.0
State government	6.8

	Low	Moderate	High
Projected 1995 employment ..	7,300	7,600	7,800
Percent change, 1984-95	1.6	5.5	8.9

Employment growth ..... Slower than average

Nuclear engineers

EMPLOYMENT PROFILE

Total employment, 1984 9,700

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Federal Government	27.6
Utilities and sanitary services	23.9
Durable goods manufacturing	21.4
Engineering, architectural, and surveying services...	17.0

	Low	Moderate	High
Projected 1995 employment ..	10,000	11,000	11,000
Percent change, 1984-95	5.1	8.7	11.5

Employment growth ..... Slower than average

Petroleum engineers

EMPLOYMENT PROFILE

Total employment, 1984 22,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Crude petroleum and natural gas extraction	62.2
Oil and gas field services	17.9
Services	9.2

	Low	Moderate	High
Projected 1995 employment ..	25,000	26,000	27,000
Percent change, 1984-95	11.3	16.9	21.9

Employment growth ..... Average

Surveyors

EMPLOYMENT PROFILE

Total employment, 1984 44,000

Selected characteristics of workers, 1984:

Percent female	12.1
Percent black	3.1
Age distribution (percent):	
16-24 years	24.3
25-54 years	68.6
55 and older	7.1
Percent employed part time, total	4.3
Percent employed part time, voluntary	2.9

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Engineering, architectural, and surveying services...	52.2
Local government	8.5
Federal Government	8.3
General contractors, except building	5.9

	Low	Moderate	High
Projected 1995 employment ..	48,000	50,000	52,000
Percent change, 1984-95	9.9	13.9	17.5

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require that surveyors be licensed. Requirements for licensure vary, but most jurisdictions require applicants to have some combination of formal education and work experience on a surveying crew and to pass a licensing examination. A few colleges and universities offer the bachelor's degree in surveying; others offer courses in surveying as part of a civil engineering or forestry curriculum. Surveying programs also are available in postsecondary vocational schools and community or junior colleges. Applicants should be in good physical condition and have strong mathematics skills.

Training completions:

Public vocational secondary and postsecondary, 1983:
Surveying and mapping technology 179

Natural Scientists and Mathematicians

Actuaries

EMPLOYMENT PROFILE

Total employment, 1984 7,700

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Life insurance	38.1
Miscellaneous services (includes consulting actuaries; engineering, architectural, and surveying services; and accounting, auditing, and bookkeeping services)	24.2
Insurance agents, brokers, and services	14.8
Fire, marine, and casualty insurance	12.4

	Low	Moderate	High
Projected 1995 employment ..	11,000	12,000	12,000
Percent change, 1984-95	43.6	51.5	58.0

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. A strong background in mathematics, including statistics, is required. Some employers require a bachelor's degree with a major in mathematics or statistics; others accept a major in engineering, economics, or business administration. Employers generally prefer well-rounded individuals

with a liberal arts background, including social science and communication, and who have passed several examinations offered by professional actuarial societies.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Mathematics:
  - Bachelor's 12,453
  - Master's 2,837
  - Ph.D. 698

Agricultural scientists

EMPLOYMENT PROFILE

Total employment, 1984 20,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	23.2
Federal Government	14.5
Agricultural services	14.1
State government	10.1
Miscellaneous business services (including commercial testing laboratories; research and development laboratories; and management, consulting, and public relations services)	9.7
Nondurable goods manufacturing	9.4
Local government	8.8

	Low	*Moderate*	*High*
Projected 1995 employment	22,000	23,000	24,000
Percent change, 1984-95	11.1	14.0	16.6

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. The bachelor's degree is adequate preparation for some jobs in sales, inspection, and other nonresearch areas, and a master's degree is sufficient for some jobs in applied research. A doctorate in an agricultural science specialty usually is required for college teaching and for independent research.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Agribusiness and agricultural production, agricultural sciences, and renewable natural resources:
  - Bachelor's 20,909
  - Master's 4,254
  - Ph.D. 1,149

Characteristics of entrants. Most entrants are recent college graduates with a degree in agricultural science or a related field; some have worked part or full-time in another occupation while attending college or graduate school. Some persons with previous training or experience in agriculture transfer from another occupation.

Biological scientists

EMPLOYMENT PROFILE

Total employment, 1984 54,000

Selected characteristics of workers, 1984:
- Percent female 31.0
- Percent black 3.4
- Age distribution (percent):
  - 16-24 years 9.7
  - 25-54 years 83.5
  - 55 and older 6.8
- Percent employed part time, total 6.1
- Percent employed part time, voluntary 5.0

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Federal Government	25.7
State government	12.9
Miscellaneous business services (includes commercial testing laboratories; research and development laboratories; and management, consulting, and public relations services)	12.5
Drug manufacturing	11.7
Educational services	10.0
Health services	9.1

	Low	*Moderate*	*High*
Projected 1995 employment	62,000	64,000	65,000
Percent change, 1984-95	14.3	17.4	20.4

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Although a bachelor's degree may be adequate preparation for some beginning jobs, promotions may be limited for those who hold no higher degree. A master's degree is sufficient for some jobs in research, but the doctorate generally is required for college teaching or independent research.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Life sciences:
  - Bachelor's 39,982
  - Master's 5,696
  - Ph.D. 3,341

Characteristics of entrants. Most entrants are recent college graduates with a degree in biology or a closely related field; some have worked part or full time in another occupation while attending college or graduate school. A relatively small number with training or experience in biology transfer from another occupation.

Chemists

EMPLOYMENT PROFILE

Total employment, 1984 85,000

Selected characteristics of workers, 1984:
- Percent female 23.4
- Percent black 6.3
- Age distribution (percent):
  - 16-24 years 7.3
  - 25-54 years 79.5
  - 55 and older 13.2
- Percent employed part time, total 2.3
- Percent employed part time, voluntary 2.1

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Chemical and allied products manufacturing	35.8
Miscellaneous business services (includes commercial testing laboratories; and management, consulting, and public relations services)	14.5
Federal Government	10.2
Durable goods manufacturing	9.6

	Low	Moderate	High
Projected 1995 employment	90,000	94,000	97,000
Percent change, 1984-95	5.4	10.0	13.9

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. A bachelor's degree in chemistry is the generally accepted requirement for entry, although graduate training is required for many jobs.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Chemistry:
  - Bachelor's 10,796
  - Master's 1,622
  - Ph.D. 1,746

Characteristics of entrants. The majority of entrants are recent college graduates with a degree in chemistry or a related field; some have worked part or full time in another occupation while attending college or graduate school.

Computer systems analysts

EMPLOYMENT PROFILE

Total employment, 1984 308,000

Selected characteristics of workers, 1984:
- Percent female 30.0
- Percent black 5.3
- Age distribution (percent):
  - 16-24 years 8.1
  - 25-54 years 87.5
  - 55 and older 4.4
- Percent employed part time, total 3.7
- Percent employed part time, voluntary 3.0

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Computer and data processing services	19.1
Durable goods manufacturing	15.4
Federal Government	11.4
Finance, insurance, and real estate	11.2
Wholesale trade, durable goods	7.3

	Low	Moderate	High
Projected 1995 employment	498,000	520,000	539,000
Percent change, 1984-95	61.5	68.7	74.8

Employment growth ..... Much faster than average

Annual separation rate (percent) 9.1

SUPPLY PROFILE

Usual entry and training requirements. The majority of jobs require at least a bachelor's degree. Previous work experience also is important. Employers' preferences also depend upon the work being done. Analysts with a background in accounting or business management are preferred for work in a business environment, while those with a background in the physical sciences, applied mathematics, or engineering are preferred for work in scientifically oriented organizations. Because computer technology changes so rapidly, continuous study—either through company-sponsored programs or courses at colleges and universities—is needed to keep skills up to date.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Computer and information sciences 7,202

Earned degrees, baccalaureate and above, 1983:
- Computer and information sciences:
  - Bachelor's 24,506
  - Master's 5,321
  - Ph.D. 262

Characteristics of entrants. Most entrants are college graduates. The majority of entrants transfer from another occupation, such as computer programmer, engineer, or manager, and are somewhat older than entrants to other occupations. Most of the remaining entrants are recent graduates who have been attending school full time or persons who have been between jobs.

Foresters and conservation scientists

EMPLOYMENT PROFILE

Total employment, 1984 25,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Federal Government	54.9
State government	19.7
Agriculture, forestry, and fishing	7.5

	Low	Moderate	High
Projected 1995 employment	27,000	27,000	27,000
Percent change, 1984-95	6.0	7.0	8.1

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. A bachelor's degree in forestry, range management, range science, or soil conservation is the minimum educational requirement. Advanced degrees are preferred for certain jobs, such as teaching and research.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Agricultural sciences, general; agronomy; soil sciences; renewable natural resources, general; forestry production and processing; forestry and related sciences; and range management:
  - Bachelor's 6,468
  - Master's 1,770
  - Ph.D. 443

Characteristics of entrants. Typical entrants are college graduates who previously have been in school full time or working in another occupation. Entrants sometimes start in a related technician occupation and transfer into a job as a forester or conservation scientist when an opening occurs.

Geologists and geophysicists

EMPLOYMENT PROFILE

Total employment, 1984 46,000

Selected characteristics of workers, 1984:

Percent female	14.0
Percent black	.6
Age distribution (percent):	
16-24 years	4.2
25-54 years	74.6
55 and older	21.2
Percent employed part time, total	8.9
Percent employed part time, voluntary	7.1

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Crude petroleum and natural gas	41.6
Federal Government	18.2
Oil and gas field services	12.5
Miscellaneous business services (includes research and development laboratories; commercial testing laboratories; and management, consulting, and public relations services)	6.2

	Low	*Moderate*	*High*
Projected 1995 employment	51,000	53,000	55,000
Percent change, 1984-95	11.1	14.8	18.0

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. A bachelor's degree in geology or geophysics is adequate for entry into some lower level geology jobs, but jobs with advancement potential usually require at least a master's degree in geology or geophysics. A doctorate in geology or geophysics usually is required for college teaching or independent research.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Geological sciences and miscellaneous physical sciences:	
Bachelor's	6,977
Master's	1,861
Ph.D.	421

Characteristics of entrants. Most entrants are recent college graduates with a degree in geology or geophysics; some have worked part or full time in another occupation while attending graduate school. Some with appropriate training and experience transfer from a related occupation.

Mathematicians

EMPLOYMENT PROFILE

Total employment, 1984 21,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Federal Government	36.9
Miscellaneous business services (includes management, consulting, and public relations services and research and development laboratories)	16.6
Educational services	8.1
Miscellaneous services (includes engineering, architectural, and surveying services and accounting, auditing, and bookkeeping services)	6.8
Durable goods manufacturing	6.3

	Low	*Moderate*	*High*
Projected 1995 employment	24,000	25,000	25,000
Percent change, 1984-95	16.3	19.2	21.6

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. A bachelor's degree in mathematics is required for beginning jobs. However, an advanced degree—preferably the doctorate—is required for research and other more responsible positions. A master's degree in mathematics is generally required for teaching jobs in 2-year colleges and technical institutes, but a doctorate is needed for full faculty status in most 4-year colleges and universities.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Mathematics:	
Bachelor's	12,453
Master's	2,837
Ph.D.	698

Meteorologists

EMPLOYMENT PROFILE

Total employment, 1984 5,500

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Federal Government	49.5
Miscellaneous services (includes engineering, architectural, and surveying services; noncommercial educational, scientific, and research organizations; and weather forecasting services)	24.8
Durable goods manufacturing	13.7

	Low	*Moderate*	*High*
Projected 1995 employment	6,200	6,400	6,400
Percent change, 1984-95	13.5	15.6	17.4

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. A bachelor's degree with a major in meteorology is the usual minimum requirement for beginning jobs in weather forecasting, although employers prefer to hire those with an advanced degree. An advanced degree, preferably in meteorology, is needed for research, college teaching, and for many top level positions in other meteorological activities.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Atmospheric sciences and meteorology:
  - Bachelor's 396
  - Master's 183
  - Ph.D. 80

Physicists and astronomers

EMPLOYMENT PROFILE

Total employment, 1984 20,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Federal Government	29.1
Miscellaneous business services (includes research and development laboratories and commercial testing laboratories)	25.8
Miscellaneous services (includes engineering, architectural, and surveying services; non-commercial educational, scientific, and research organizations; and consulting physicists)	14.4
Electrical and electronic machinery and equipment	10.6

	Low	*Moderate*	*High*
Projected 1995 employment	21,000	21,000	22,000
Percent change, 1984-95	5.8	8.7	11.1

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Graduate training in physics or a closely related field generally is required for most entry level jobs. A doctorate is usually required for independent research, for full faculty status in 4-year colleges and universities, and for jobs in astronomy.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Physics:
  - Bachelor's 3,793
  - Master's 1,369
  - Ph.D. 873

Statisticians

EMPLOYMENT PROFILE

Total employment, 1984 23,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Federal Government	16.7
Transportation equipment manufacturing	12.5
Business services	12.4
Finance, insurance, and real estate	12.0
State government	11.2

	Low	*Moderate*	*High*
Projected 1995 employment	26,000	26,000	27,000
Percent change, 1984-95	12.5	16.6	20.2

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. The minimum educational requirement for beginning jobs in statistics is a bachelor's degree with a major in statistics, or a major in an applied field, such as economics, and a minor in statistics. An advanced degree is required for teaching jobs at colleges and universities and research positions in private industry.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Statistics; business statistics:
  - Bachelor's 374
  - Master's 476
  - Ph.D. 134

Social Scientists, Social Workers, Religious Workers, and Lawyers

Clergy

EMPLOYMENT PROFILE

Total employment, 1984 296,000

Selected characteristics of workers, 1984:
- Percent female 6.3
- Percent black 5.3
- Age distribution (percent):
  - 16-24 years 2.3
  - 25-54 years 70.9
  - 55 and older 26.8
- Percent employed part time, total 7.5
- Percent employed part time, voluntary 6.1

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Religious organizations	97.6

	Low	*Moderate*	*High*
Projected 1995 employment	303,000	315,000	328,000
Percent change, 1984-95	2.4	6.3	10.8

Employment growth ..... Slower than average

Annual separation rate (percent) 6.3

SUPPLY PROFILE

Usual entry and training requirements. Entry requirements vary widely. Both rabbis and Roman Catholic priests must complete a course of study in a seminary. Some Protestant denominations require no formal training, while many others only ordain those who have been trained in Bible colleges, Bible institutes, or liberal arts colleges. Most important, members of the clergy must have a deep religious faith and a desire to serve the spiritual needs of others.

Training completions:

Earned degrees, first professional, 1983:
- Theology (B.D., M. Div., or Rabbi) 6,494

Characteristics of entrants. The majority of entrants have some college training; about half of all entrants are college graduates. Because of lengthy training requirements, entrants are generally somewhat older than entrants to other occupations.

Economists

EMPLOYMENT PROFILE

Total employment, 1984 38,000

Selected characteristics of workers, 1984:
- Percent female 39.6
- Percent black 4.8
- Age distribution (percent):
  - 16-24 years 9.9
  - 25-54 years 82.6
  - 55 and older 7.5
- Percent employed part time, total 4.6
- Percent employed part time, voluntary 3.7

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Miscellaneous business services (includes management, consulting, and public relations services)	25.1
Federal Government	22.1
State government	11.5
Communications and utilities	8.2
Finance, insurance, and real estate	7.8

	Low	*Moderate*	*High*
Projected 1995 employment	44,000	45,000	47,000
Percent change, 1984-95	15.8	19.2	22.2

Employment growth ..... Average

Annual separation rate (percent) 8.1

SUPPLY PROFILE

Usual entry and training requirements. Although a bachelor's degree is sufficient for many entry level positions, many employers prefer a graduate degree. A master's degree generally is the minimum requirement for a job as an instructor in many junior colleges and small 4-year colleges. The Ph.D degree is necessary for faculty positions at most colleges and universities.

In the Federal Government, candidates for entry positions generally need a college degree with a minimum of 21 semester hours of economics and 3 hours of statistics, accounting, or calculus.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Economics:
  - Bachelor's 20,517
  - Master's 1,972
  - Ph.D. 734

Characteristics of entrants. Entrants are typically college graduates who transfer from another occupation. Some have worked in that occupation while in graduate school. The remaining entrants have not been working—most were in school or between jobs. Because of the importance of graduate training, entrants tend to be older than entrants to other occupations.

Lawyers

EMPLOYMENT PROFILE

Total employment, 1984 490,000

Selected characteristics of workers, 1984:
- Percent female 16.1
- Percent black 2.3
- Age distribution (percent):
  - 16-24 years 2.7
  - 25-54 years 83.4
  - 55 and older 13.9
- Percent employed part time, total 5.9
- Percent employed part time, voluntary 4.9

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Legal services	62.8
Local government	12.1
Federal Government	6.7
State government	6.4

	Low	*Moderate*	*High*
Projected 1995 employment	635,000	665,000	691,000
Percent change, 1984-95	29.5	35.5	40.8

Employment growth ..... Much faster than average

Annual separation rate (percent) 4.9

SUPPLY PROFILE

Usual entry and training requirements. To practice law in any State or the District of Columbia, a person must be admitted to its bar. Usually, applicants for admission to the bar must pass a written examination. To qualify for the examination in most jurisdictions, an applicant must complete at least 3 years of college and graduate from an accredited law school. Lawyers who have been admitted to the bar in one jurisdiction sometimes may be admitted in another without taking the bar examination, although requirements vary. Many participate in programs offered by law schools and State and local bar associations to stay abreast of recent developments.

Training completions:

Earned degrees, first professional, 1983:
- Juris Doctor (J.D.) and Bachelor of Law (LL.B.) 36,540

Characteristics of entrants. Most entrants are recent law school graduates age 25 to 34 who have not been working, largely because they were full-time students. Other entrants transfer into the occupation; many of these are recent law school graduates who have attended law school while working as law clerks or in another occupation. Some transfer into law after using their law degree to pursue a career in business, politics, or another field in which a thorough knowledge of law is valuable.

Psychologists

EMPLOYMENT PROFILE

Total employment, 1984 97,000

Selected characteristics of workers, 1984:

Percent female	54.8
Percent black	9.4
Age distribution (percent):	
16-24 years	3.6
25-54 years	87.0
55 and older	9.4
Percent employed part time, total	20.7
Percent employed part time, voluntary	16.8

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	40.6
Health services	26.2
Social services	10.0
State government	7.8
Federal Government	6.0

	Low	*Moderate*	*High*
Projected 1995 employment	113,000	118,000	122,000
Percent change, 1984-95	16.7	21.3	26.0

Employment growth ..... Faster than average

Annual separation rate (percent) 8.5

SUPPLY PROFILE

Usual entry and training requirements. A doctorate in psychology generally is required for most jobs. All States and the District of Columbia require psychologists who want to enter independent practice to be licensed. Licensure requirements vary but generally include a doctorate in psychology, 2 years of professional experience, and passing written and oral examinations.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Psychology:	
Bachelor's	40,364
Master's	8,378
Ph.D.	3,108

Characteristics of entrants. Almost all entrants are recent college graduates; many have been employed in another occupation while in graduate school. Because of the lengthy training involved, entrants to this occupation tend to be somewhat older than other entrants.

Recreation workers

EMPLOYMENT PROFILE

Total employment, 1984 123,000

Selected characteristics of workers, 1984:

Percent female	72.1
Percent black	10.2
Age distribution (percent):	
16-24 years	38.4
25-54 years	53.1
55 and older	8.5
Percent employed part time, total	25.9
Percent employed part time, voluntary	19.1

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Local government	35.5
Civic, social, and fraternal organizations	21.4
Social services	14.2
Nursing and personal care facilities	10.7

	Low	*Moderate*	*High*
Projected 1995 employment	144,000	149,000	155,000
Percent change, 1984-85	17.1	21.3	26.1

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Academic requirements vary widely. Many jobs require a college degree with a major in recreation, leisure studies, or physical education. A liberal arts degree is acceptable for some positions. High school graduates and graduates of associate degree programs in parks and recreation, social work, and other human service technologies are accepted for some jobs. No matter what their background, employees may be expected to participate in employer-sponsored training programs or informal on-the-job training. Some recreation jobs require specialized training, certification, or experience in a particular field, such as art, music, drama, swimming, or other athletics.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Parks and recreation:	
Bachelor's	5,198
Master's	565
Ph.D.	33

Social workers

EMPLOYMENT PROFILE

Total employment, 1984 335,000

Selected characteristics of workers, 1984:

Percent female	64.1
Percent black	18.3
Age distribution (percent):	
16-24 years	6.7
25-54 years	83.0
55 and older	10.3
Percent employed part time, total	10.9
Percent employed part time, voluntary	7.9

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Social services	24.5
State government	23.3
Health services	20.4
Local government	19.6

	Low	*Moderate*	*High*
Projected 1995 employment	396,000	410,000	425,000
Percent change, 1984-95	18.1	22.2	26.8

Employment growth ..... Faster than average

Annual separation rate (percent) 10.6

SUPPLY PROFILE

Usual entry and training requirements. A bachelor's degree is the minimum requirement for most positions. Besides the bachelor's degree in social work (BSW), a major in psychology, sociology, and related fields satisfies hiring requirements in many social service agencies. A master's degree in social work (MSW) is generally required for positions in the mental health field and is almost always necessary for supervisory, administrative, or research positions. Social workers in private practice need an MSW, and many have additional education. A doctorate in social work usually is required for teaching and is desirable for some research and administrative jobs. Thirty-three States have licensing or registration laws regarding social work practice.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Social work:	
Bachelor's	10,263
Master's	9,244
Ph.D.	201

Characteristics of entrants. The majority of people who enter this field are college graduates. They tend to be older than entrants to other occupations. The majority of entrants have not been working—many have been in school; others are experienced workers who have been tending to family responsibilities or have been laid off or are between jobs. The remaining entrants transfer from another occupation. Many of these have worked part time while enrolled in a social work program; others transfer from a job taken on a temporary basis until a more desirable position could be found.

Sociologists

EMPLOYMENT PROFILE

Total employment, 1984 5,600

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
State government	31.0
Business services	21.2
Educational services	14.3
Noncommercial educational and residential care organizations	12.8
Local government	7.9

	Low	*Moderate*	*High*
Projected 1995 employment	5,800	5,900	6,100
Percent change, 1984-95	2.8	5.8	8.8

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. A master's degree in sociology is sufficient for most administrative and research positions in public agencies and private industry, provided applicants have adequate training in research, statistics, and computer methods. A doctorate is required for most teaching and research positions in colleges and universities and for some positions in private industry. Those who hold a bachelor's degree often find jobs in a related field, such as social work or welfare counseling.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Sociology:	
Bachelor's	14,105
Master's	1,112
Ph.D.	522

Urban and regional planners

EMPLOYMENT PROFILE

Total employment, 1984 17,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Local government	61.7
State government	19.3
Business services	6.2

	Low	*Moderate*	*High*
Projected 1995 employment	18,000	19,000	19,000
Percent change, 1984-95	6.1	9.1	12.1

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Most entry jobs in Federal, State, and local government agencies require 2 years of graduate study in urban or regional planning or the equivalent in work experience. Persons who have a bachelor's degree in city planning, architecture, or engineering may qualify for some beginning positions.

Training completions:

Earned degrees, baccalaureate and above, 1983:

City, community, and regional planning:	
Bachelor's	450
Master's	1,043
Ph.D.	67

Characteristics of entrants. Virtually all entrants are college graduates; some have held part-time jobs in another occupation while in school. Some transfer into the field from a job taken on a temporary basis until a job as an urban planner becomes available.

Teachers, Counselors, Librarians, and Archivists

Adult and vocational education teachers

EMPLOYMENT PROFILE

Total employment, 1984 256,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	58.5
Social services	9.6
Membership organizations	6.1
State government	6.0
Federal Government	6.0

	Low	Moderate	High
Projected 1995 employment ..	295,000	304,000	314,000
Percent change, 1984-95	15.5	18.7	23.0

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Training requirements vary widely by State and by subject. Adult and vocational education teachers usually are required to have a college degree in the field in which they are teaching. Those who are teaching courses in the blue-collar trades or noncredit courses may only need experience in the field.

Archivists and curators

EMPLOYMENT PROFILE

Total employment, 1984 11,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Museums and art galleries	28.4
Educational services	25.3
Local government	16.5
Federal Government	15.5

	Low	Moderate	High
Projected 1995 employment ..	12,000	12,000	12,000
Percent change, 1984-95	4.6	6.9	9.7

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Employment as an archivist or curator generally requires substantial college training and experience. Archivists ordinarily have an undergraduate or graduate degree in history or a related field, or in archival or library science. Curators ordinarily have an undergraduate degree in museum studies or a discipline reflecting a museum specialty—art, for example—and experience in museum activities, such as art restoration and exhibit design.

Characteristics of entrants. Virtually all entrants are college graduates. Most entrants either have not been working because they have been in school full time or have transferred from a related occupation.

College and university faculty

EMPLOYMENT PROFILE

Total employment, 1984 731,000

Selected characteristics of workers, 1984:

Percent female	36.6
Percent black	4.7
Age distribution (percent):	
16-24 years	6.9
25-54 years	76.0
55 and older	17.1
Percent employed part time, total	26.0
Percent employed part time, voluntary	20.1

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Educational services	100.0

	Low	Moderate	High
Projected 1995 employment ..	636,000	654,000	675,000
Percent change, 1984-95	−13.1	−10.6	−7.6

Employment growth ..... Decline

Annual separation rate (percent) 16.9

SUPPLY PROFILE

Usual entry and training requirements. Four-year colleges and universities generally require a doctoral degree; 2-year institutions often regard a master's degree as adequate preparation.

Characteristics of entrants. Entrants are almost equally divided between those who have not been working and those who transfer from another occupation. Although some entrants are recent graduates, many are older, experienced workers. Because of the extensive education required, the majority of entrants are over 25. Many work part time.

Counselors

EMPLOYMENT PROFILE

Total employment, 1984 152,000

Selected characteristics of workers, 1984:

Percent female	54.2
Percent black	12.2
Age distribution (percent):	
16-24 years	7.2
25-54 years	77.9
55 and older	14.9
Percent employed part time, total	13.8
Percent employed part time, voluntary	11.3

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Educational services	64.1
Social services	18.3
State government	9.1

	Low	Moderate	High
Projected 1995 employment ..	176,000	182,000	188,000
Percent change, 1984-95	15.4	19.3	23.5

Employment growth ..... Average

Annual separation rate (percent) 12.1

SUPPLY PROFILE

Usual entry and training requirements. A master's degree in some area of counseling, psychology, or a related field generally is required; mental health counselors may need a doctoral degree. Many employers require counselors to have additional training while on the job. Such training usually is obtained in graduate school, employer-sponsored training programs, and various workshops and classes. In some cases, individuals qualify with a bachelor's degree in psychology, sociology, counseling, or rehabilitation services, particularly if they have appropriate work experience. Many States

require public school counselors to have both counseling and teaching certificates. Counselors in most State vocational rehabilitation agencies must pass a written exam and be evaluated by a board of examiners.

Training completions:

Earned degrees, baccalaureate and above, 1983:
School psychology, student counseling and personnel services, and counseling psychology:

Bachelor's	343
Master's	13,333
Ph.D.	1,189

Characteristics of entrants. The majority of entrants are college graduates who transer from a related field such as social work, teaching, interviewing, job placement, psychology, or personnel. Other entrants have not been working—some are recent college graduates, some have been between jobs, and others are returning to work after tending to family responsibilities or after a period of retirement. Because prior work experience is common for counselors, entrants tend to be somewhat older than entrants to other occupations.

Kindergarten and elementary school teachers

EMPLOYMENT PROFILE

Total employment, 1984	1,381,000

Selected characteristics of workers, 1984:

Percent female	84.6
Percent black	9.9
Age distribution (percent):	
16-24 years	4.5
25-54 years	85.1
55 and older	10.4
Percent employed part time, total	10.5
Percent employed part time, voluntary	7.0

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	99.2

	Low	*Moderate*	*High*
Projected 1995 employment	1,615,000	1,662,000	1,716,000
Percent change, 1984-95	16.9	20.3	24.3

Employment growth ..... Faster than average

Annual separation rate (percent) 9.2

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require teachers in public elementary schools to be certified; some require teachers in private elementary schools to be certified as well. To become certified, an individual must have a bachelor's degree from an approved teacher education program, with student teaching experience, and professional education courses. In addition, many jurisdictions require teachers to obtain a master's degree within a certain period after being hired.

Training completions:

Earned degrees, baccalaureate and above, 1983:
Education, general; elementary education; and education, other:

Bachelor's	39,197
Master's	21,986
Ph.D.	1,661

Characteristics of entrants. The majority of entrants have not been working. Younger entrants tend to be recent college graduates, whereas many older entrants are returning to work after tending to household responsibilities. The remaining entrants transfer from another occupation, either held while in school or taken on a temporary basis until a job as a teacher could be found.

Librarians

EMPLOYMENT PROFILE

Total employment, 1984	155,000

Selected characteristics of workers, 1984:

Percent female	85.9
Percent black	7.6
Age distribution (percent):	
16-24 years	7.1
25-54 years	66.2
55 and older	26.7
Percent employed part time, total	21.5
Percent employed part time, voluntary	18.0

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	72.1
Local government	13.9

	Low	*Moderate*	*High*
Projected 1995 employment	166,000	171,000	177,000
Percent change, 1984-95	7.1	10.4	14.0

Employment growth ..... Slower than average

Annual separation rate (percent) 9.3

SUPPLY PROFILE

Usual entry and training requirements. A master's degree in library science usually is required for a job in public, college and university, and special libraries. Most jurisdictions require that school librarians be certified as teachers; for these jobs, a bachelor's degree in library science or a master's degree in media resources, educational technology, or audiovisual communications may be acceptable.

Training completions:

Earned degrees, baccalaureate and above, 1983:
Library science:

Bachelor's	234
Master's	2,994
Ph.D.	48

Characteristics of entrants. The typical entrant is a college graduate who previously was not working—a large proportion have a Master of Library Science degree. Those in the younger age group tend to be recent college graduates; older entrants generally are women returning to work after tending to household responsibilities.

Secondary school teachers

EMPLOYMENT PROFILE

Total employment, 1984 1,045,000

Selected characteristics of workers, 1984:
- Percent female 51.2
- Percent black 7.7
- Age distribution (percent):
  - 16-24 years 4.6
  - 25-54 years 84.7
  - 55 and older 10.7
- Percent employed part time, total 10.5
- Percent employed part time, voluntary 7.6

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	100.0

	Low	*Moderate*	*High*
Projected 1995 employment	1,062,000	1,093,000	1,129,000
Percent change, 1984-95	1.6	4.6	8.0

Employment growth ..... Slower than average

Annual separation rate (percent) ..... [1] 9.1

[1] The number of separations may be artificially high. Employment in the occupation declined between 1983 and 1984; some workers who left were not replaced.

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require public secondary school teachers to be certified; many jurisdictions require teachers in private schools to be certified as well. To become certified, individuals must have a bachelor's degree from an approved teacher education program, with a prescribed number of credits in the subject they plan to teach, student teaching experience, and professional education courses. A few States certify college graduates who have not had teacher preparation courses. Many jurisdictions require teachers to obtain a master's degree within a certain time after being hired.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Education, general; teacher education, specific subject areas; junior high education; secondary education; and education, other:
  - Bachelor's 45,120
  - Master's 31,258
  - Ph.D. 2,650

Characteristics of entrants. The majority of entrants have not been working. The majority are either recent college graduates or homemakers returning to teaching. The remaining entrants transfer from another occupation, either a job held while in school or one taken on a temporary basis until a job as a teacher could be obtained.

Health Diagnosing and Treating Practitioners

Chiropractors

EMPLOYMENT PROFILE

Total employment, 1984 31,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Offices of other health practitioners (includes offices of chiropractors)	72.3
Hospitals	27.4

	Low	*Moderate*	*High*
Projected 1995 employment	39,000	40,000	42,000
Percent change, 1984-95	23.9	28.9	34.4

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia regulate the practice of chiropractic and grant licenses to individuals who meet the educational requirements and pass a State board examination. Most jurisdictions require completion of a 4-year chiropractic course following 2 years of college. To maintain licensure, jurisdictions generally require that chiropractors complete a specific number of hours of continuing education.

Training completions:

Earned degrees, first professional, 1983:
- Chiropractic (D.C. or D.C.M.) 2,889

Dentists

EMPLOYMENT PROFILE

Total employment, 1984 156,000

Selected characteristics of workers, 1984:
- Percent female 6.2
- Percent black 9
- Age distribution (percent):
  - 16-24 years 1.1
  - 25-54 years 71.7
  - 55 and older 27.2
- Percent employed part time, total 18.5
- Percent employed part time, voluntary 16.4

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Offices of dentists	90.1

	Low	*Moderate*	*High*
Projected 1995 employment	185,000	195,000	203,000
Percent change, 1984-95	18.2	25.1	30.0

Employment growth ..... Faster than average

Annual separation rate (percent) 3.8

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require dentists to be licensed. To qualify for licensure in most jurisdictions, a candidate must be a graduate of a dental school approved by the American Dental Association and pass written and practical examinations. In order to specialize, dentists must complete additional education requirements and meet either additional licensing or professional standards.

Training completions:

Earned degrees, first professional, 1983:
D.D.S. and D.M.D. degrees 5,585

Characteristics of entrants. Almost all entrants are recent dental school graduates between the ages of 25 and 34. A small number are licensed dentists who have been serving in the Armed Forces or tending to family responsibilities.

Optometrists

EMPLOYMENT PROFILE

Total employment, 1984 29,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Offices of other health practitioners (includes offices of optometrists)	71.1
Miscellaneous retail stores (includes optical goods and related stores)	10.1

	Low	*Moderate*	*High*
Projected 1995 employment ..	35,000	36,000	38,000
Percent change, 1984-95	20.3	26.7	33.9

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require that optometrists be licensed. Applicants for licensure must have a Doctor of Optometry degree from an accredited optometric school or college and pass a board examination. Most jurisdictions require optometrists to earn continuing education credits in optometry to renew their licenses.

Training completions:

Earned degrees, first professional, 1983:
Doctor of optometry (O.D.) 1,116

Physicians

EMPLOYMENT PROFILE

Total employment, 1984 476,000

Selected characteristics of workers, 1984:
Percent female 16.0
Percent black 5.0
Age distribution (percent):
16-24 years 1.4
25-54 years 75.8
55 and older 22.8
Percent employed part time, total 6.1
Percent employed part time, voluntary 5.1

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Offices of physicians	51.0
Hospitals	26.6
Federal Government	8.2

	Low	*Moderate*	*High*
Projected 1995 employment ..	556,000	585,000	607,000
Percent change, 1984-95	17.0	23.0	27.6

Employment growth ..... Faster than average

Annual separation rate (percent) 2.7

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require physicians to be licensed. Licensure requirements include usually 8 years of postsecondary education, graduation from an accredited professional school, successful completion of a licensing examination, and, in most jurisdictions, 1 or 2 years of supervised practice in an accredited graduate medical education program (internship/residency). Throughout their career, the majority of physicians continue to study and train to keep up with the latest advances in medical science.

Training completions:

Earned degrees, first professional, 1983:
D.O. and M.D. degrees[1] 16,803

Characteristics of entrants. Almost all entrants are recent medical school graduates between the ages of 25 and 34. A small number are licensed physicians who have been serving in the Armed Forces or tending to family responsibilities.

[1] Excludes foreign medical school graduates (many of whom are U.S. citizens) who augment the supply of U.S.-trained physicians. In 1984, foreign medical school graduates accounted for about 3,000 of the 20,000 M.D. graduates in their first year of required postgraduate residency. About 21 percent of all active physicians were foreign trained in 1983.

Podiatrists

EMPLOYMENT PROFILE

Total employment, 1984 11,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Offices of other health practitioners (includes offices of podiatrists)	65.9
Offices of physicians	9.1
Nursing and personal care facilities	9.1
Hospitals	6.6

	Low	*Moderate*	*High*
Projected 1995 employment ..	15,000	15,000	16,000
Percent change, 1984-95	35.6	38.9	43.1

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require podiatrists to be licensed. Applicants for licensure must be graduates of an accredited college of podiatric medicine and must pass both written and oral examinations. Eight States require applicants to serve a 1-year residency in a hospital or clinic following graduation. To practice a specialty, additional education and experience are necessary.

Training completions:

Earned degrees, first professional, 1983:
Pod. D., D.P., and D.P.M. degrees 631

Veterinarians

EMPLOYMENT PROFILE

Total employment, 1984 40,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Agricultural services	67.9
Federal Government	9.8
Agricultural production, livestock	9.5

	Low	*Moderate*	*High*
Projected 1995 employment	47,000	48,000	50,000
Percent change, 1984-95	18.0	22.3	26.2

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require veterinarians to be licensed. Licensure requirements include graduation from an accredited college of veterinary medicine and passing both written and oral State board proficiency examinations.

Training completions:

Earned degrees, first professional, 1983:
D.V.M 2,060

Registered Nurses, Pharmacists, Dietitians, Therapists, and Physician Assistants

Dietitians and nutritionists

EMPLOYMENT PROFILE

Total employment, 1984 48,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	33.0
Nursing and personal care facilities	17.2
Social services	14.0
Government	12.7
Educational services	8.9

	Low	*Moderate*	*High*
Projected 1995 employment	58,000	60,000	62,000
Percent change, 1984-95	21.5	25.8	30.7

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Most employers require a bachelor's degree with a major in foods and nutrition or institution management for entry level positions. Almost all employers prefer dietitians who have been registered by the American Dietetic Association; for some jobs, registration is required. Registration requirements usually include a combination of education, an approved dietetic internship, and work experience.

Training completions:

Earned degrees, baccalaureate and above, 1983:
Food sciences and human nutrition:
Bachelor's 3,354
Master's 783
Ph.D 63

Characteristics of entrants. Some entrants are recent college graduates; others with the appropriate qualifications have been employed in another occupation. Persons who have been unemployed, tending to family responsibilities, or not working for other reasons fill most of the remaining jobs.

Occupational therapists

EMPLOYMENT PROFILE

Total employment, 1984 25,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	40.0
Educational services	17.0
Government	13.7
Social services	7.7
Nursing and personal care facilities	7.5
Offices of other health practitioners (includes offices of occupational therapists)	5.9
Outpatient care facilities	5.4

	Low	*Moderate*	*High*
Projected 1995 employment	32,000	33,000	35,000
Percent change, 1984-95	26.5	31.3	36.7

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. A bachelor's degree in occupational therapy is the minimum requirement for work in this field. In addition, 29 States and the District of Columbia require occupational therapists to be licensed. Applicants for licensure must have a degree or certificate from an accredited educational program and pass the American Occupational Therapy Association's certification examination. A graduate degree often is required for teaching, research, or administrative positions.

Training completions:

Earned degrees, baccalaureate and above, 1983:
Occupational therapy:
Bachelor's 1,807
Master's 234

Characteristics of entrants. The majority of entrants are experienced therapists returning to work after tending to family responsibilities or are recent graduates of formal training programs. The remainder transfer from another occupation—individuals with appropriate qualifications who have been employed in another occupation or persons who worked while in school.

Pharmacists

EMPLOYMENT PROFILE

Total employment, 1984 151,000

Selected characteristics of workers, 1984:

Percent female	28.5
Percent black	2.9
Age distribution (percent):	
16-24 years	9.2
25-54 years	76.3
55 and older	14.5
Percent employed part time, total	14.7
Percent employed part time, voluntary	12.1

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Drug stores and propietary stores	62.8
Hospitals	26.3

	Low	*Moderate*	*High*
Projected 1995 employment	158,000	166,000	173,000
Percent change, 1984-95	4.6	9.7	14.4

Employment growth ..... Slower than average

Annual separation rate (percent) 2.9

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require pharmacists to be licensed. Requirements include graduating from an accredited pharmacy program, passing a board examination, and completing a specified amount of practical experience or serving an internship under the supervision of a licensed pharmacist. Many jurisdictions require continuing education for license renewal.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Pharmacy:	
Bachelor's	5,708
Master's	331
Ph.D.	111
D. Pharm.	705

Characteristics of entrants. Most entrants are recent graduates of pharmacy school who are between 20 and 34 years of age. A few are experienced pharmacists who reenter the occupation after tending to family responsibilities.

Physical therapists

EMPLOYMENT PROFILE

Total employment, 1984 58,000

Selected characteristics of workers, 1984:

Percent female	76.7
Percent black	3.9
Age distribution (percent):	
16-24 years	14.2
25-54 years	82.6
55 and older	3.2
Percent employed part time, total	20.1
Percent employed part time, voluntary	16.6

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	40.3
Offices of other health practitioners (includes offices of physical therapists)	19.8
Nursing and personal care facilities	8.7
Government	7.8
Educational services	5.4
Offices of physicians	5.0

	Low	*Moderate*	*High*
Projected 1995 employment	79,000	83,000	86,000
Percent change, 1984-95	35.5	42.2	48.1

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. A bachelor's degree in physical therapy is the minimum requirement for most jobs. In addition, all States and the District of Columbia require physical therapists to be licensed. Applicants for licensure must have a degree or certificate from an accredited physical therapy educational program and pass a licensure examination. A graduate degree is generally required for teaching, research, and administrative positions. Continuing education and training are necessary to keep up with medical developments.

Training completions:

Earned degrees, baccalaureate and above, 1983:

Physical therapy:	
Bachelor's	2,581
Master's	303

Characteristics of entrants. Some job entrants are recent graduates of formal training programs; others are experienced therapists returning to work after tending to family responsibilities or individuals with appropriate qualifications who have been employed in another occupation. Many entrants work on a contract basis for one or more employers, which permits many to work part time or on a flexible schedule.

Physician assistants

EMPLOYMENT PROFILE

Total employment, 1984 25,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Offices of physicians	49.4
Hospitals	21.5
Government	11.9
Outpatient care facilities	6.7

	Low	*Moderate*	*High*
Projected 1995 employment	33,000	35,000	37,000
Percent change, 1984-95	33.2	40.3	46.0

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. Nearly all States require applicants to complete an approved formal training program offered by schools of allied health, community and 4-year colleges and universities, medical schools, and hospitals. "Hands on" health care experience, in a job such as medical technologist or physical therapist, is an important qualification for entry to training programs. To remain current with advances in medicine, physician assistants must continue to train and study throughout their career.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Physician assisting-primary care, and physician assisting-specialty 1,584

Associate degrees and other awards below the baccalaureate, 1983:
- Physician assisting-primary care, and physician assisting-specialty 221

Characteristics of entrants. Almost all physician assistants enter directly upon completing a formal program in physician assisting. Some of these have been working in a health-related occupation while in school. Because previous experience in the health care field is important in gaining entry to training, graduates tend to be somewhat older than entrants to other occupations.

Recreational therapists

EMPLOYMENT PROFILE

Total employment, 1984 17,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	40.3
Nursing and personal care facilities	22.6
State government	9.2
Social services	8.3
Outpatient care facilities	8.0
Federal Government	6.2

	Low	*Moderate*	*High*
Projected 1995 employment	20,000	21,000	22,000
Percent change, 1984-95	18.7	22.7	27.4

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Education requirements vary by employment setting. A degree in therapeutic recreation or in recreation with an emphasis on therapeutic recreation is the usual requirement for a professional position in this field. An associate degree satisfies hiring requirements in many nursing homes, while a bachelor's degree is ordinarily necessary in community and clinical settings.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Recreational therapy:
  - Bachelor's 169

Registered nurses

EMPLOYMENT PROFILE

Total employment, 1984 1,377,000

Selected characteristics of workers, 1984:
- Percent female 96.0
- Percent black 7.6
- Age distribution (percent):
  - 16-24 years 8.5
  - 25-54 years 81.4
  - 55 and older 10.1
- Percent employed part time, total 26.9
- Percent employed part time, voluntary 22.7

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	66.8
Government	6.8
Offices of physicians	6.8
Nursing and personal care facilities	5.6

	Low	*Moderate*	*High*
Projected 1995 employment	1,753,000	1,829,000	1,908,000
Percent change, 1984-95	27.3	32.8	38.6

Employment growth ..... Much faster than average

Annual separation rate (percent) 9.0

SUPPLY PROFILE

Usual entry and training requirements. To obtain the license to practice that is required by all States and the District of Columbia, nurses must graduate from an approved school of nursing—courses of study range from 2 to 5 years—and pass a national examination administered by each jurisdiction. Nurses may be licensed in more than one jurisdiction either by examination or by endorsement. Because some jurisdictions require continuing education for license renewal and to keep abreast of changes in the medical field, many registered nurses continue to study and train throughout their career.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Nursing 29,031

Private noncollegiate postsecondary, 1981:
- Nursing 5,061

Associate degrees and other awards below baccalaureate, 1983:
- Nursing 38,847

Earned degrees, baccalaureate and above, 1983:
- Nursing:
  - Bachelor's 32,161
  - Master's 5,946
  - Ph.D. 166

Characteristics of entrants. Job openings are filled either by recent nursing school graduates or from the reserve pool of licensed but inactive nurses—those tending to family responsibilities, working in another occupation, or pursuing additional education. The majority of all entrants are 25 to 54 years of age and almost all have had some postsecondary education.

Respiratory therapists

EMPLOYMENT PROFILE

Total employment, 1984 55,000

Selected characteristics of workers, 1984:
- Percent female 68.7
- Percent black 7.4
- Age distribution (percent):
  - 16-24 years 23.5
  - 25-54 years 73.4
  - 55 and older 3.1
- Percent employed part time, total 16.6
- Percent employed part time, voluntary 13.7

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Hospitals	89.9

	Low	Moderate	High
Projected 1995 employment	63,000	66,000	69,000
Percent change, 1984-95	15.6	20.8	26.5

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Although some respiratory therapists are trained on the job, employers generally hire graduates of formal training programs in respiratory care. These programs are offered at the postsecondary level by vocational schools, hospitals, medical schools, colleges and universities, and the Armed Forces. Applicants need a working knowledge of science and mathematics, mechanical ability, and manual dexterity.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Respiratory therapy and respiratory therapy technology . 3,017

Private noncollegiate postsecondary, 1981:
- Respiratory therapy technology 3,219

Associate degrees and other awards below baccalaureate, 1983:
- Respiratory therapy and respiratory therapy technology . 3,370

Characteristics of entrants. Most entrants to this occupation have some college education. Among those who enter the field of respiratory care, the majority are recent graduates of formal training programs, experienced therapists returning to work after tending to family responsibilities, or others with appropriate qualifications who have not been employed. Some individuals transfer from another occupation.

Speech pathologists and audiologists

EMPLOYMENT PROFILE

Total employment, 1984 47,000

Selected characteristics of workers, 1984:

Percent female	90.0
Percent black	2.9
Age distribution (percent):	
16-24 years	10.2
25-54 years	87.6
55 and older	2.2
Percent employed part time, total	23.0
Percent employed part time, voluntary	18.5

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Educational services	67.4
Hospitals	9.9
Government	7.4
Outpatient care facilities	6.2

	Low	Moderate	High
Projected 1995 employment	54,000	55,000	57,000
Percent change, 1984-85	13.8	17.3	21.1

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. A master's degree in speech-language pathology or audiology is the standard credential in most settings. In most public school systems, a bachelor's degree in speech-language pathology or audiology and appropriate certification satisfy hiring requirements. Thirty-six States require licenses for those offering speech pathology and audiology services in private practice, clinics, or other settings outside schools. Although licensure laws vary, all States require graduation from an accredited educational program, 300 hours of supervised clinical experience, and an examination.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Audiology and speech pathology:
  - Bachelor's 3,041
  - Master's 2,859
  - Ph.D. 93

Characteristics of entrants. Entrants tend to be recent graduates of formal training programs, or individuals with appropriate qualifications who have been tending to family responsibilities, between jobs, or employed in another occupation. Many speech pathologists and audiologists work on a contract or consultant basis, and the proportion on voluntary part-time schedules is higher than the average for all professional specialty workers.

Health Technologists and Technicians

Clinical laboratory technologists and technicians

EMPLOYMENT PROFILE

Total employment, 1984 236,000

Selected characteristics of workers, 1984:

Percent female	75.6
Percent black	12.8
Age distribution (percent):	
16-24 years	17.2
25-54 years	77.6
55 and older	5.2
Percent employed part time, total	17.4
Percent employed part time, voluntary	14.8

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Hospitals	63.5
Offices of physicians	11.5
Medical and dental laboratories	10.3
Government	8.6

	Low	Moderate	High
Projected 1995 employment	243,000	254,000	265,000
Percent change, 1984-95	2.6	7.5	12.0

Employment growth ..... Slower than average

Annual separation rate (percent) 8.5

SUPPLY PROFILE

Usual entry and training requirements. The usual requirement for a beginning job as a clinical laboratory technologist is a bachelor's

degree with a major in medical technology or in one of the life sciences. Clinical laboratory technicians generally are required to have an associate degree or to have completed the training program in a postsecondary vocational school. Some States require technologists and technicians to be licensed. In order to keep abreast of medical developments, technologists and technicians often take skill improvement training offered at hospitals, colleges and universities, and vocational schools.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Medical laboratory technologies 6,360

Private noncollegiate postsecondary, 1981:
- Medical laboratory assisting and other medical laboratory technology 4,346

Associate degrees and other awards below baccalaureate, 1983:
- Medical laboratory technologies 3,263

Earned degrees, baccalaureate and above, 1983:
- Medical laboratory technologies:
  - Bachelor's 2,632

Characteristics of entrants. Individuals who take clinical laboratory jobs are equally divided between transfers from another occupation and those who have not been working—mainly recent graduates of medical technology programs and homemakers. Two out of three entrants are between the ages of 20 and 34. Most entrants have attended college, although not all have a degree.

Dental hygienists

EMPLOYMENT PROFILE

Total employment, 1984 76,000

Selected characteristics of workers, 1984:
- Percent female 99.0
- Percent black 2.6
- Age distribution (percent):
  - 16-24 years 17.7
  - 25-54 years 80.3
  - 55 and older 2.0
- Percent employed part time, total 49.0
- Percent employed part time, voluntary 44.2

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Offices of dentists	96.3

	Low	*Moderate*	*High*
Projected 1995 employment	92,000	98,000	102,000
Percent change, 1984-95	20.8	28.7	34.0

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Dental hygienists must be licensed. To get a license, a candidate must graduate from an accredited dental hygiene school and pass both a written and a clinical examination.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Dental hygiene 2,545

Associate and other degrees below baccalaureate, 1983:
- Dental hygiene 3,646

Characteristics of entrants. Most entrants are either recent graduates of a dental hygiene training program or experienced hygienists returning to work after tending to family responsibilities. Most have attended college, and many have a degree. Compared to other job entrants, people who start working as dental hygienists are much more likely to be in their twenties or early thirties, and to work part time.

Dispensing opticians

EMPLOYMENT PROFILE

Total employment, 1984 42,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Miscellaneous retail stores (includes optical goods and related stores)	40.9
Offices of other health practitioners (includes offices of optometrists)	34.8
Wholesale trade	9.1

	Low	*Moderate*	*High*
Projected 1995 employment	49,000	51,000	54,000
Percent change, 1984-95	17.7	23.2	29.0

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Although dispensing opticians learn their skills on the job, employers generally prefer applicants who are familiar with the trade and who have had some formal training in optical dispensing and fabricating. Training is offered by community colleges, vocational schools, and manufacturers. A high school diploma with courses in science and mathematics and experience in a related job are assets. Some jurisdictions require dispensing opticians to be licensed, and continuing education is necessary for relicensure.

Training completions:

Private noncollegiate postsecondary, 1983:
- Ophthalmic dispensing 247

Associate degrees and other awards below baccalaureate, 1983:
- Ophthalmic dispensing 151

Electrocardiograph technicians

EMPLOYMENT PROFILE

Total employment, 1984 21,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	76.7
Federal Government	17.2

	Low	*Moderate*	*High*
Projected 1995 employment	24,000	24,000	25,000
Percent change, 1984-95	11.8	15.8	20.0

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Training usually lasts 4 to 6 weeks for the basic "resting" electrocardiogram (EKG). Applicants must be high school graduates, be able to follow detailed instructions, exhibit presence of mind in emergencies, be reliable, and have mechanical aptitude. Beyond the entry level, a small number of formal programs offer preparation for specialized EKG testing. These 12- to 24-month programs, located chiefly in hospitals and community colleges, offer in-depth study of cardiovascular anatomy and physiology.

Electroencephalographic technologists and technicians

EMPLOYMENT PROFILE

Total employment, 1984 5,900

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	87.7
Offices of physicians	10.8

	Low	*Moderate*	*High*
Projected 1995 employment	6,700	7,000	7,300
Percent change, 1984-95	14.1	19.6	25.1

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Electroencephalographic (EEG) technicians generally learn their skills on the job. Employers normally require a high school diploma. Many EEG technologists also learn their skills on the job, but some graduate from formal postsecondary training programs offered by hospitals and medical centers, vocational schools, community colleges, and colleges and universities. Applicants for both specialties should have manual dexterity, good vision, an aptitude for working with electronic equipment, and the ability to work with patients and with other health professionals.

Training completions:

American Medical Association's Committee on Allied Health Education and Accreditation accredited programs, 1984:
Electroencephalographic technologist 131

Emergency medical technicians

EMPLOYMENT PROFILE

Total employment, 1984 47,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Local government	37.4
Hospitals	30.9
Local and suburban transportation	30.6

	Low	*Moderate*	*High*
Projected 1995 employment	49,000	50,000	52,000
Percent change, 1984-95	3.9	7.1	10.6

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Completion of a formal 110-hour training program designed by the U.S. Department of Transportation is required for an entry level job as an emergency medical technician (EMT). Training is offered by police, fire, and health departments; by hospitals; and as a nondegree course in colleges and universities. Applicants to an EMT training course generally must be at least 18 years old, have a high school diploma or the equivalent, and have a valid driver's license. All States and the District of Columbia certify graduates of approved training programs who meet experience requirements and pass an examination. With additional formal training, EMT's can qualify for the title of EMT-Intermediate or EMT-Paramedic. EMT's should be physically fit, emotionally stable, and able to adapt to difficult situations.

Training completions:

Public vocational secondary and postsecondary, 1983:
Emergency medical technology-ambulance, and emergency medical technology-paramedic 7,624
Associate degrees and other awards below baccalaureate, 1983:
Emergency medical technology-ambulance, and emergency medical technology-paramedic 3,316

Licensed practical nurses

EMPLOYMENT PROFILE

Total employment, 1984 602,000

Selected characteristics of workers, 1984:
Percent female 96.3
Percent black 17.1
Age distribution (percent):
16-24 years 7.7
25-54 years 79.2
55 and older 13.1
Percent employed part time, total 26.0
Percent employed part time, voluntary 20.5

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	55.3
Nursing and personal care facilities	16.9
Offices of physicians	6.4
Government	5.7

	Low	*Moderate*	*High*
Projected 1995 employment	680,000	708,000	739,000
Percent change, 1984-95	13.0	17.6	22.7

Employment growth ..... Average

Annual separation rate (percent) 12.3

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require practical nurses to be licensed. Applicants for licensure must complete an approved program in practical nursing and pass the national written examination.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Nursing 29,031

Private noncollegiate postsecondary, 1981:
- Practical (vocational) nursing 16,973

Associate degrees and other awards below baccalaureate, 1983:
- Nursing 38,847

Characteristics of entrants. The majority of entrants are recent nursing school graduates or licensed but inactive nurses who have been tending to family responsibilities or have been unemployed. The remainder transfer from another occupation. Because the occupation of L.P.N. is characterized by movement from employment to home and back again, entrants tend to be older than average.

Medical record technicians

EMPLOYMENT PROFILE

Total employment, 1984 33,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	73.3
Nursing and personal care facilities	8.7
Federal Government	7.7

	Low	*Moderate*	*High*
Projected 1995 employment	42,000	44,000	46,000
Percent change, 1984-95	26.4	31.4	37.0

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. Most employers prefer to hire graduates of accredited 2-year associate degree programs. However, many experienced record clerks may be promoted to technician status after completing a hospital's training program or correspondence courses offered by the American Medical Record Association.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Medical records technology 834

Private noncollegiate postsecondary, 1981:
- Medical records technology 495

Associate degrees and other awards below baccalaureate, 1983:
- Medical records technology 1,069

Characteristics of entrants. Entrants fall into two categories—those who transfer from another occupation, primarily medical record clerk, and those who enter the field after graduating from an accredited 2-year associate degree program.

Radiologic technologists

EMPLOYMENT PROFILE

Total employment, 1984 115,000

Selected characteristics of workers, 1984:
- Percent female 66.9
- Percent black 7.4
- Age distribution (percent):
  - 16-24 years 20.1
  - 25-54 years 75.5
  - 55 and older 4.4
- Percent employed part time, total 13.7
- Percent employed part time, voluntary 10.2

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	68.7
Offices of physicians	22.6

	Low	*Moderate*	*High*
Projected 1995 employment	135,000	141,000	148,000
Percent change, 1984-95	17.6	23.5	28.9

Employment growth ..... Faster than average

Annual separation rate (percent) 8.5

SUPPLY PROFILE

Usual entry and training requirements. Completion of a formal training program in radiography, nuclear medicine technology, radiation therapy technology, or diagnostic medical sonography is required for entry level jobs in hospitals, which employ most radiologic technologists. Technologists in physicians' or dentists' offices may be trained on the job. Many jobs require registration or certification with the appropriate organization. Some jurisdictions require radiologic technologists to be licensed.

Training completions:

American Medical Association's Committee on Allied Health Education and Accreditation accredited programs, 1984:
- Diagnostic medical sonographer, nuclear medicine technologist, radiation therapy technologist, and radiographer 8,810

Characteristics of entrants. The majority of job openings are filled by people who have not been working—recent graduates, individuals with appropriate qualifications who are returning to work after tending to family responsibilities, and others. The remainder transfer from another occupation, such as medical technologist or respiratory therapist. The majority of entrants have attended college.

Surgical technicians

EMPLOYMENT PROFILE

Total employment, 1984 36,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Hospitals	97.9

	Low	*Moderate*	*High*
Projected 1995 employment	40,000	41,000	43,000
Percent change, 1984-95	9.4	14.3	19.7

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Most employers require graduation from a formal training program in surgical technology. Programs last from 9 months to 2 years and are offered by community and junior colleges, postsecondary vocational schools, and hospitals. The shorter programs are designed for licensed practical nurses, who already have some background in anatomy, physiology, and clinical practice. The longer programs are for individuals with no background in health care. Additional training is required before technicians can assist in complex procedures, such as open-heart surgery, or work with new equipment, such as lasers.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Surgical technology	1,532
Private noncollegiate postsecondary, 1981:	
Surgical technician	901
Associate degrees and other awards below baccalaureate, 1983:	
Surgical technology	1,152

Writers, Artists, and Entertainers

Actors, directors, and producers

EMPLOYMENT PROFILE

Total employment, 1984	50,000
Selected characteristics of workers, 1984:	
Percent female	31.5
Percent black	4.2
Age distribution (percent):	
16-24 years	10.4
25-54 years	78.9
55 and older	10.7
Percent employed part time, total	15.2
Percent employed part time, voluntary	7.4

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Motion picture production and services	70.5
Theatrical producers, bands, and entertainers	23.3

	Low	*Moderate*	*High*
Projected 1995 employment	58,000	61,000	63,000
Percent change, 1984-95	17.3	22.9	27.4

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Talent is what counts most in getting an acting job. This talent generally is developed through acting experience and formal training at dramatic arts schools or colleges and universities. There are no specific training requirements for directors and producers, but talent, experience, and business acumen are very important. Some colleges and universities offer formal training in directing and producing which can be useful in obtaining a job.

Training completions:

Earned degrees, baccalaureate and above, 1983:	
Dramatic arts:	
Bachelor's	5,208
Master's	1,157
Ph.D.	97

Characteristics of entrants. For most actors and actresses, employment is unsteady. Typically, they enter and reenter the occupation after periods of unemployment or work in a temporary job such as waiter, waitress, or sales worker.

Dancers and choreographers

EMPLOYMENT PROFILE

Total employment, 1984	10,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Theatrical producers, bands, and entertainers	35.1
Motion picture production and services	17.4
Eating and drinking places	17.0
Dance halls, studios, and schools	6.6
Hotels, motels, and tourist courts	6.0

	Low	*Moderate*	*High*
Projected 1995 employment	12,000	12,000	13,000
Percent change, 1984-95	17.2	21.1	25.1

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Serious training for a career in dancing traditionally begins by about age 12. Early ballet training begins at age 7 or 8 and is usually given by private teachers and independent ballet schools. Talented students who demonstrate potential in their early teens receive more intensive and advanced professional training at regional ballet schools or schools conducted under the auspices of the major ballet companies. Early and intensive training also is important for the modern dancer, but modern dance does not require as many years of training as ballet. Because of the strenuous and time-consuming training required, general education may be minimal, and few employers require formal education beyond high school.

Training completions:

Earned degrees, baccalaureate and above, 1983:	
Dance:	
Bachelor's	748
Master's	202

Characteristics of entrants. For most dancers, employment is unsteady. Typically, they enter and reenter the occupation after periods of unemployment or work in a temporary job such as waiter, waitress, or sales worker. Almost all entrants are under the age of 25 and few have any formal education beyond high school.

Designers

EMPLOYMENT PROFILE

Total employment, 1984	205,000
Selected characteristics of workers, 1984:	
Percent female	52.0
Percent black	3.2
Age distribution (percent):	
16-24 years	12.8
25-54 years	76.0
55 and older	11.2

Percent employed part time, total 17.8
Percent employed part time, voluntary 13.4

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Miscellaneous retail stores (includes florists and artists' supply and material stores)	31.7
Durable goods manufacturing	14.9
Business services	9.4
Furniture and home furnishings stores	9.2
Nondurable goods manufacturing	8.9
Engineering, architectural and surveying services	7.3

	Low	Moderate	High
Projected 1995 employment	239,000	251,000	261,000
Percent change, 1984-95	16.6	22.4	27.2

Employment growth ..... Faster than average

Annual separation rate (percent) 15.4

SUPPLY PROFILE

Usual entry and training requirements. Employers look for persons with artistic talent to fill entry level jobs. Artistic skills may be developed through work experience in a related job or by taking classes in design. Although an increasing number are acquiring the necessary skills from formal degree and nondegree training programs in design, many people learn the profession informally by working with experienced designers. Some designers upgrade their skills by taking classes in design or by participating in in-house skill improvement programs.

Training completions:

Earned degrees, baccalaureate and above, 1983:
Design:
Bachelor's 4,049
Master's 248

Characteristics of entrants. The majority of entrants have not been working—persons tending to family responsibilities, full-time students, and persons between jobs. The remaining entrants transfer from another occupation—some have worked part time while in school and others transfer from a job they had taken temporarily until a more suitable position could be found. Most entrants have had some postsecondary training, and many are college graduates. Entrants tend to be somewhat older than entrants to other occupations, reflecting the increasing importance of postsecondary training and the fact that many people return to this occupation after tending to household responsibilities. Many of the entrants are employed in part-time positions.

Graphic and fine artists

EMPLOYMENT PROFILE

Total employment, 1984 204,000

Selected characteristics of workers, 1984:
Percent female 47.4
Percent black 2.4
Age distribution (percent):
16-24 years 11.0
25-54 years 75.5
55 and older 13.5
Percent employed part time, total 25.4
Percent employed part time, voluntary 18.1

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Advertising	21.2
Mailing, reproduction, commercial art, and stenographic services	19.5
Printing, publishing, and allied industries	15.7
Retail trade	8.2
Government	7.6

	Low	Moderate	High
Projected 1995 employment	252,000	264,000	274,000
Percent change, 1984-95	23.5	29.4	34.3

Employment growth ..... Faster than average

Annual separation rate (percent) 15.2

SUPPLY PROFILE

Usual entry and training requirements. Employers are more interested in demonstrated ability, as represented by an applicant's portfolio, than in evidence of appropriate training or other qualifications. However, considerable training as well as artistic talent is needed to create an impressive portfolio. Therefore, the majority of aspiring graphic and fine artists participate in postsecondary art programs, which are offered by 4-year colleges and universities, community and junior colleges, and postsecondary vocational schools.

Training completions:

Public vocational secondary and postsecondary, 1983:
Crafts, design, fine arts, and graphic arts technology . 1,256
Private noncollegiate postsecondary, 1981 16,354
Associate degrees and other awards below baccalaureate, 1983:
Crafts, design, fine arts, and graphic arts technology . 4,975
Earned degrees, baccalaureate and above, 1983:
Crafts, design, fine arts, and graphic arts technology:
Bachelor's 20,800
Master's 3,182
Ph.D. 154

Characteristics of entrants. The majority of entrants have not been working—most are recent graduates of a training program or experienced workers who have been tending to household responsibilities. The remainder transfer from another occupation; in many cases, entrants have been working in another occupation while attending a training program.

Musicians

EMPLOYMENT PROFILE

Total employment, 1984 192,000

Selected characteristics of workers, 1984:
Percent female 27.6
Percent black 6.4
Age distribution (percent):
16-24 years 15.3
25-54 years 70.2
55 and older 14.5
Percent employed part time, total 55.4
Percent employed part time, voluntary 35.7

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Religious organizations	48.3
Theatrical producers, bands, and entertainers	30.6
Eating and drinking places	9.7

	Low	Moderate	High
Projected 1995 employment	208,000	217,000	226,000
Percent change, 1984-95	8.5	13.4	18.1

Employment growth ..... Average

Annual separation rate (percent) 22.0

SUPPLY PROFILE

Usual entry and training requirements. People who become professional musicians generally begin studying an instrument at an early age. Intensive training is needed to acquire the necessary skill, knowledge of music, and ability to interpret music. This training may be obtained through private study with an accomplished musician, in a college or university music program, in a music conservatory, or through practice with a group. For study in an institution, an audition frequently is necessary.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Music general; music performance; and music theory and composition:
  - Bachelor's 7,262
  - Master's 3,222
  - Ph.D. 380

Characteristics of entrants. For most musicians, employment is unsteady. Typically, they enter and reenter the occupation after periods of unemployment or work in a temporary job such as waiter, waitress, or sales worker. Most entrants are less than 35 years of age and have had some college education.

Photographers and camera operators

EMPLOYMENT PROFILE

Total employment, 1984 101,000

Selected characteristics of workers, 1984:
- Percent female 20.2
- Percent black 8.5
- Age distribution (percent):
  - 16-24 years 17.7
  - 25-54 years 71.5
  - 55 and older 10.8
- Percent employed part time, total 16.2
- Percent employed part time, voluntary 9.9

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Photographic and portrait studios	24.4
Business services	19.3
Radio and television broadcasting	14.0
Government	8.6
Newspapers	8.6
Educational services	7.7

	Low	Moderate	High
Projected 1995 employment	123,000	129,000	134,000
Percent change, 1984-95	22.6	28.6	33.3

Employment growth ..... Faster than average

Annual separation rate (percent) 14.9

SUPPLY PROFILE

Usual entry and training requirements. There are no formal education requirements for entry level jobs. Employers usually seek applicants who can demonstrate a broad technical understanding of photography as well as other photographic talents, such as imagination, creativity, and a good sense of timing. These skills often can be obtained by working with experienced photographers and camera operators or are acquired through formal training available in colleges and universities, junior and community colleges, postsecondary vocational schools, and the Armed Forces. For a job in scientific or industrial photography, some knowledge of the field may be required.

Training completions:

Armed Forces enlisted strength, 1985:
- Photography 5,429

Associate degrees and other awards below baccalaureate, 1983:
- Photography 301

Earned degrees, baccalaureate and above, 1983:
- Photography:
  - Bachelor's 772

Characteristics of entrants. The majority of all entrants transfer from another occupation, such as photographic process worker, that they had entered on a temporary basis until a suitable job could be found. The remainder have not been working—mostly unemployed persons, full-time students, and those who have been tending to family responsibilities. Almost all entrants are high school graduates, and many have had some postsecondary training in photography. Entrants typically are younger than entrants to other occupations, and most start their careers in a part-time job.

Public relations specialists

EMPLOYMENT PROFILE

Total employment, 1984 95,000

Selected characteristics of workers, 1984:
- Percent female 48.6
- Percent black 6.1
- Age distribution (percent):
  - 16-24 years 9.8
  - 25-54 years 75.2
  - 55 and older 15.0
- Percent employed part time, total 11.3
- Percent employed part time, voluntary 9.9

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Business	15.1
Finance, insurance, and real estate	12.3
Educational services	12.2
Membership organizations	11.4
Government	8.6
Communications and utilities	7.3

	Low	Moderate	High
Projected 1995 employment	119,000	125,000	130,000
Percent change, 1984-95	25.7	31.6	36.4

Employment growth ..... Much faster than average

Annual separation rate (percent) 18.2

SUPPLY PROFILE

Usual entry and training requirements. Employers generally require a college degree or relevant work experience. Some employers seek persons who have majored in journalism, public relations, or another communications specialty; others look for a technical major related to the firm's business, such as engineering, finance, or computer science. Experience in journalism, sales, or a technical field can provide valuable experience in writing copy, dealing with people, and learning about the organization's products or services.

Training completions:

Earned degrees, baccalaureate and above, 1983:
- Communications:
  - Bachelor's 36,954
  - Master's 3,502
  - Ph.D. 205

Characteristics of entrants. Most entrants transfer from another occupation—most of these have been working in a job that prepares them for public relations work; some probably have been working part time while in school. The remaining entrants have not been working—primarily students and persons tending to family responsibilities. Most entrants have had some college training, and almost half have a degree. Because so many have work experience, they tend to be older than entrants to other occupations.

Radio and television announcers and newscasters

EMPLOYMENT PROFILE

Total employment, 1984 56,000

Selected characteristics of workers, 1984:
- Percent female 22.0
- Percent black 11.7
- Age distribution (percent):
  - 16-24 years 47.5
  - 25-54 years 46.2
  - 55 and older 6.3
- Percent employed part time, total 41.6
- Percent employed part time, voluntary 27.5

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Radio and television broadcasting	97.1

	Low	Moderate	High
Projected 1995 employment	60,000	62,000	65,000
Percent change, 1984-95	6.7	11.3	16.2

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Although not always required, formal training usually is necessary to develop one's talents. The videotaped audition that presents samples of an applicant's delivery, style, and appearance often is the most important factor in hiring. Announcers must have a pleasant and well-controlled voice, good timing, excellent pronunciation, and good grammar.

Training completions:

Associate degrees and other awards below baccalaureate, 1983:
- Radio-television news broadcast and radio-television, general 352

Earned degrees, baccalaureate and above, 1983:
- Radio-television news broadcast and radio-television, general:
  - Bachelor's 6,115
  - Master's 334
  - Ph.D. 21

Characteristics of entrants. The majority of entrants are college graduates. Many have been working part time while in school, while others transfer from a job that helped them develop the required skills.

Reporters and correspondents

EMPLOYMENT PROFILE

Total employment, 1984 69,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Newspapers	72.0
Radio and television broadcasting	17.7

	Low	Moderate	High
Projected 1995 employment	79,000	82,000	86,000
Percent change, 1984-95	13.9	19.3	24.2

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Most employers prefer college graduates who have at least a bachelor's degree in journalism, including training in the liberal arts. Typing skill is necessary, and the ability to take shorthand and to use computerized word processing equipment is an asset. Applicants should be able to present facts and opinions clearly and succinctly.

Training completions:

Associate degrees and other awards below baccalaureate, 1983:
- Journalism 522

Earned degrees, baccalaureate and above, 1983:
- Journalism:
  - Bachelor's 10,074
  - Master's 1,102
  - Ph.D. 40

Characteristics of entrants. The majority of entrants are college graduates. Many transfer into the occupation—some from an internship program where they have worked part time on a newspaper or magazine staff or at a radio or TV station. Others have been in school or between jobs.

Writers and editors

EMPLOYMENT PROFILE

Total employment, 1984 191,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Newspapers	22.0
Business services	15.8
Durable goods manufacturing	14.0
Periodicals	9.9
Membership organizations	6.4
Books	5.7
Federal Government	5.2

	Low	Moderate	High
Projected 1995 employment	234,000	245,000	254,000
Percent change, 1984-95	22.2	28.0	32.8

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Many employers require applicants to have a college degree; some prefer a major in liberal arts or social science; others prefer a communications or journalism major. Some jobs—technical writing, for example—require a degree in or detailed knowledge about a specialized field such as engineering. Aspiring writers and editors should be familiar with research techniques and be able to work under the pressure of deadlines.

Training completions:

Associate degrees and other awards below baccalaureate, 1983:
- Journalism 522

Earned degrees, baccalaureate and above, 1983:
- Journalism:
  - Bachelor's 10,074
  - Master's 1,102
  - Ph.D. 40

Technologists and Technicians, Except Health

Air traffic controllers

EMPLOYMENT PROFILE

Total employment, 1984 22,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Federal Government	100.0

	Low	Moderate	High
Projected 1995 employment	22,000	22,000	22,000
Percent change, 1984-95	2.3	0.5	−1.5

Employment growth ..... Little change

SUPPLY PROFILE

Usual entry and training requirements. Air traffic controllers must successfully complete the Civil Service examination and training program at the Federal Aviation Administration academy in Oklahoma City. Applicants generally must have 3 years of general work experience or a college degree or a combination of experience and education. Applicants also must pass physical and psychological examinations, have vision correctable to 20/20, and be under 35 years of age.

Broadcast technicians

EMPLOYMENT PROFILE

Total employment, 1984 25,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Radio and television broadcasting	80.2
Federal Government	13.1

	Low	Moderate	High
Projected 1995 employment	29,000	30,000	31,000
Percent change, 1984-95	16.3	20.5	24.9

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Federal law requires persons who operate broadcast transmitters in radio and television stations to have a restricted radiotelephone operator permit, for which no examination is required. Those who work with microwave or other internal radio communications equipment, however, must have a general radiotelephone operator license, issued after passing a series of written examinations. Vocational school, community college, or college training in engineering or electronics is the best preparation. Manual dexterity—the ability to perform tasks required precise, coordinated hand movements—is necessary for success in this occupation.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Communication technologies 3,099

Private noncollegiate postsecondary, 1981:
- Electrical technology 18,189

Computer programmers

EMPLOYMENT PROFILE

Total employment, 1984 341,000

Selected characteristics of workers, 1984:
- Percent female 35.4
- Percent black 5.3
- Age distribution (percent):
  - 16-24 years 19.7
  - 25-54 years 77.6
  - 55 and older 2.7
- Percent employed part time, total 6.0
- Percent employed part time, voluntary 5.2

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Computer and data processing services	19.1
Finance, insurance, and real estate	12.7
Government	7.7
Nondurable goods manufacturing	7.1
Office, computing, and accounting machine manufacturing	6.5
Wholesale trade	6.1
Electrical and electronic machinery and equipment manufacturing	5.5

	Low	Moderate	High
Projected 1995 employment	559,000	586,000	609,000
Percent change, 1984-95	63.8	71.7	78.5

Employment growth ..... Much faster than average

Annual separation rate (percent) 8.9

SUPPLY PROFILE

Usual entry and training requirements. Training requirements vary widely, reflecting employers' needs. Many employers require a bachelor's degree in computer science or a related field; some require a graduate degree. Other employers accept applicants with fewer than 4 years of college who have related work experience. Because of rapidly changing technology, programmers usually continue their training through programs sponsored by their company or courses offered at colleges or vocational schools.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Computer and information sciences	7,202
Private noncollegiate postsecondary, 1981:	
Computer programmer	22,329
Associate degrees and other awards below baccalaureate, 1983:	
Computer and information sciences	12,132
Earned degrees, baccalaureate and above, 1983:	
Computer and information sciences:	
Bachelor's	24,506
Master's	5,321
Ph.D.	262

Characteristics of entrants. Entrants are about equally divided between those who transfer from another occupation and those who have not been working. Many who transfer do so from a related occupation, such as mathematics teacher, physics teacher, or engineer. Others probably are experienced computer operators who are advancing after acquiring appropriate training or persons who have been working part time while in school. Entrants who have not been working typically have been in school or between jobs. Most entrants have at least some college education and are between 20 and 34 years of age.

Drafters

EMPLOYMENT PROFILE

Total employment, 1984 345,000

Selected characteristics of workers, 1984:

Percent female	15.4
Percent black	3.7
Age distribution (percent):	
16-24 years	20.4
25-54 years	69.8
55 and older	9.8
Percent employed part time, total	4.8
Percent employed part time, voluntary	3.8

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Engineering, architectural, and surveying services	31.9
Machinery manufacturing, except electrical	9.8
Electrical and electronic machinery and equipment manufacturing	7.5
Business services	7.3
Communications and utilities	5.8
Transportation equipment manufacturing	5.7

	Low	Moderate	High
Projected 1995 employment	366,000	384,000	400,000
Percent change, 1984-95	6.2	11.3	15.8

Employment growth ..... Average

Annual separation rate (percent) 16.0

SUPPLY PROFILE

Usual entry and training requirements. Employers prefer applicants who have 2 years of postsecondary training in technical institutes, junior and community colleges, or extension divisions of universities. An exposure to computer-aided design techniques is helpful, but employers mainly look for applicants with a thorough knowledge of drafting fundamentals, knowledge of design theory, and neatness.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Drafting	28,500
Private noncollegiate postsecondary, 1981:	
Drafting occupations	7,962
Associate degrees and other awards below baccalaureate, 1983:	
Drafting	5,540

Characteristics of entrants. About half of all entrants have not been working; they are primarily recent graduates of a training program or experienced drafters who were between jobs. The remainder transfer from another occupation; in many cases, entrants have been working in another occupation while attending a training program.

Electrical and electronics technicians

EMPLOYMENT PROFILE

Total employment, 1984 404,000

Selected characteristics of workers, 1984:

Percent female	13.8
Percent black	5.9
Age distribution (percent):	
16-24 years	15.7
25-54 years	78.5
55 and older	5.8
Percent employed part time, total	2.9
Percent employed part time, voluntary	2.3

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Electrical and electronic machinery and equipment manufacturing	16.6
Machinery, equipment, and supplies wholesalers	15.3
Communications and utilities	10.7
Business services	8.8
Federal Government	5.5

	Low	Moderate	High
Projected 1995 employment	579,000	607,000	629,000
Percent change, 1984-95	43.2	50.0	55.7

Employment growth ..... Much faster than average

Annual separation rate (percent) 7.9

SUPPLY PROFILE

Usual entry and training requirements. Although persons can qualify through many combinations of work experience and education, most employers prefer applicants who have specialized technical training offered by junior and community colleges, postsecondary vocational schools, and the Armed Forces. Applicants should have an aptitude for mathematics and science and enjoy technical work.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Electrical and electronic technologies 24,671

Private noncollegiate postsecondary, 1981:
- Electrical and electronic technologies 19,505

Associate degrees and other awards below baccalaureate, 1983:
- Electrical and electronic technologies 30,434

Characteristics of entrants. About half of all entrants have not been working—most have been in school full time; others have been between jobs. The remaining entrants transfer from an occupation where they have acquired needed skills or worked part time while completing formal training programs. Many entrants have some postsecondary training, but few have a college degree. About 8 out of 10 entrants are between 25 and 34 years of age.

Engineering technicians

EMPLOYMENT PROFILE

Total employment, 1984 326,000

Selected characteristics of workers, 1984:
- Percent female 29.5
- Percent black 6.2
- Age distribution (percent):
  - 16-24 years 15.8
  - 25-54 years 74.4
  - 55 and older 9.8
- Percent employed part time, total 6.9
- Percent employed part time, voluntary 5.6

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Transportation equipment manufacturing	11.5
Engineering, architectural, and surveying services	11.3
Federal Government	10.3
State government	8.8
Electrical and electronic machinery and equipment manufacturing	8.4
Machinery manufacturing, except electrical	7.8
Miscellaneous business services (includes research and development laboratories and commercial testing laboratories)	6.8
Communications and utilities	6.0

	Low	Moderate	High
Projected 1995 employment	398,000	416,000	430,000
Percent change, 1984-95	22.6	27.7	32.2

Employment growth ..... Faster than average

Annual separation rate (percent) 17.9

SUPPLY PROFILE

Usual entry and training requirements. Most employers prefer applicants who have had specialized technical training in postsecondary vocational schools, junior and community colleges, or colleges and universities. Persons also can qualify through on-the-job training, apprenticeship programs, correspondence schools, or Armed Forces experience. Because of rapidly changing technologies, engineering technicians usually continue their training throughout their career.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Engineering and engineering-related technologies 55,866

Associate degrees and other awards below the baccalaureate, 1983:
- Engineering and engineering-related technologies 61,075

Characteristics of entrants. The majority of entrants transfer from another occupation—many were working part or full time while completing a formal training program. Most of the remainder were full-time students or experienced technicians who have been tending to family responsibilities or were between jobs. The majority of entrants have had some postsecondary education.

Legal assistants

EMPLOYMENT PROFILE

Total employment, 1984 53,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Legal services	75.9
Local government	7.5
State government	7.3
Federal Government	5.7

	Low	Moderate	High
Projected 1995 employment	100,000	104,000	108,000
Percent change, 1984-95	89.5	97.5	104.9

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. Legal assistants, often called paralegals, must understand legal terminology and have good communication and research skills. Familiarity with the operation and applications of computers in legal research is an important asset. Knowledge of a specialized area of law practice, such as real estate or taxation, is preferred by many employers. Skills are acquired through previous work experience—for example, as a legal secretary—or postsecondary education. Increasingly, employers are requiring completion of a formal legal assistant training program.

Training completions:

Associate degrees and other awards below the baccalaureate, 1983:
- Legal assisting 2,015

Earned degrees, baccalaureate and above, 1983:
- Legal assisting:
  - Bachelor's 300

Library technicians

EMPLOYMENT PROFILE

Total employment, 1984 42,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	57.0
Local government	27.1
Federal Government	6.6

	Low	*Moderate*	*High*
Projected 1995 employment	45,000	46,000	47,000
Percent change, 1984-95	6.2	9.0	12.2

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Most employers prefer applicants with postsecondary training in library technology, offered by community and junior colleges and postsecondary vocational schools. However, some technicians are trained on the job. In addition, some libraries encourage staff members to take courses in library technology to improve their job skills.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Library assisting 105

Private noncollegiate postsecondary, 1981:
- Library assistant 2,886

Associate degrees and other awards below baccalaureate, 1983:
- Library assisting 196

Science technicians

EMPLOYMENT PROFILE

Total employment, 1984 239,000

Selected characteristics of workers, 1984:
- Percent female 35.4
- Percent black 9.4
- Age distribution (percent):
  - 16-24 years 21.0
  - 25-54 years 71.1
  - 55 and older 7.9
- Percent employed part time, total 13.6
- Percent employed part time, voluntary 11.4

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Chemical and allied products manufacturing	19.0
Federal Government	18.2
Educational services	16.3
Durable goods manufacturing	8.2

	Low	*Moderate*	*High*
Projected 1995 employment	270,000	279,000	288,000
Percent change, 1984-95	13.1	16.9	20.4

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Most employers prefer applicants who have at least 2 years of specialized training or experience in postsecondary vocational schools, junior or community colleges, or colleges and universities. Some technicians qualify for their job with training obtained informally on the job, in the Armed Forces, or in company training programs. Many science technicians have a bachelor's degree in a scientific field.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Science technologies 1,432

Associate degrees and other awards below the baccalaureate, 1983:
- Science technologies 1,514

Characteristics of entrants. About half of all entrants transfer from another occupation. Most of the remainder are recent graduates of a formal training program or were between jobs. Most entrants have completed some training beyond high school, and over half have a college degree.

Tool programmers, numerical control

EMPLOYMENT PROFILE

Total employment, 1984 11,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Electrical and electronic machinery manufacturing	16.4
Aircraft and parts manufacturing	11.5
Engineering, architectural, and surveying services	9.3
Metalworking machinery and equipment manufacturing	7.6
Office, computing, and accounting machine manufacturing	6.1
Fabricated metal products manufacturing	5.6
Construction machinery manufacturing	5.0

	Low	*Moderate*	*High*
Projected 1995 employment	13,000	14,000	15,000
Percent change, 1984-95	26.0	32.2	37.4

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. Tool programmers learn their jobs through a combination of work experience and vocational study and training. Employers prefer to promote or hire skilled machinists for programmer jobs. Some employers will hire people without machining experience if they have completed vocational school or junior college courses in tool programming and have demonstrated the ability to learn machine operations.

Marketing and Sales Occupations

Cashiers

EMPLOYMENT PROFILE

Total employment, 1984 1,902,000

Selected characteristics of workers, 1984:

Percent female	83.8
Percent black	10.7
Age distribution (percent):	
16-24 years	51.7
25-54 years	40.2
55 and older	8.1
Percent employed part time, total	52.8
Percent employed part time, voluntary	36.7

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Grocery stores	44.0
Services	8.7
Eating and drinking places	8.5
General merchandise stores	8.3
Drug and proprietary stores	6.3
Gasoline service stations	5.1

	Low	*Moderate*	*High*
Projected 1995 employment	2,343,000	2,469,000	2,579,000
Percent change, 1984-95	23.2	29.8	35.6

Employment growth ..... Faster than average

Annual separation rate (percent) 30.4

SUPPLY PROFILE

Usual entry and training requirements. Although previous sales experience and familiarity with cash registers are helpful in getting a job, there are no formal academic or experience requirements. Most cashiers acquire their skills on the job. Many employers prefer high school graduates.

Characteristics of entrants. This is primarily an entry level job. The majority of entrants have not been working; they have been in school, full-time homemakers, or experienced cashiers who have been laid off or are between jobs. Many have no prior work experience. The remaining entrants transfer from another clerical or blue-collar occupation. An unusually large proportion of entrants are under 20 years of age. Most entrants hold a part-time job, working during peak sales periods.

Insurance sales workers

EMPLOYMENT PROFILE

Total employment, 1984 371,000

Selected characteristics of workers, 1984:

Percent female	25.5
Percent black	5.4
Age distribution (percent):	
16-24 years	7.2
25-54 years	75.0
55 and older	17.8
Percent employed part time, total	7.6
Percent employed part time, voluntary	5.9

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Life insurance	57.8
Insurance agents, brokers, and services	29.0
Fire, marine, and casualty insurance	7.8

	Low	*Moderate*	*High*
Projected 1995 employment	384,000	405,000	422,000
Percent change, 1984-95	3.4	9.1	13.7

Employment growth ..... Slower than average

Annual separation rate (percent) 10.4

SUPPLY PROFILE

Usual entry and training requirements. Most employers will hire high school graduates with proven sales ability or who have been successful in other types of work. Some employers require a college degree. All States and the District of Columbia require agents and brokers to be licensed. In most jurisdictions, applicants for licensure must pass written examinations covering insurance fundamentals and laws. Because a growing number of jurisdictions have mandatory continuing education requirements, many sales workers take courses at colleges and universities and attend institutes, conferences, and seminars sponsored by insurance organizations.

Characteristics of entrants. The majority of entrants transfer from another occupation. The remainder have not been working—most have been between jobs or have been tending to family responsibilities. Entrants tend to be older than entrants to other occupations, reflecting the importance of previous work experience. The majority of entrants have some college training, and many have a degree.

Manufacturers' sales workers

EMPLOYMENT PROFILE

Total employment, 1984 547,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Machinery manufacturing, except electrical	12.4
Newspapers	12.1
Food and allied products manufacturing	9.1
Fabricated metal products manufacturing	7.0
Chemical and allied products manufacturing	7.0
Electrical and electronic machinery and equipment manufacturing	6.9

	Low	*Moderate*	*High*
Projected 1995 employment	569,000	598,000	623,000
Percent change, 1984-95	4.0	9.3	13.8

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Although a college degree is increasingly desirable, many employers hire individuals without a degree who have sales experience or special knowledge of the product line being sold. Manufacturers of technical products usually require a college degree in science or engineering. Most manufacturers have formal training programs lasting up to 2 years. As with most sales occupations, a pleasant personality and the ability to get along with other people are important assets.

Characteristics of entrants. Over half of all entrants transfer from other occupations. The remainder have not been working—some were recent graduates; others were on temporary layoff. Because of the emphasis on work experience, entrants tend to be older than entrants to other occupations. More than half of all entrants have some college education, and many have a degree.

Real estate agents and brokers

EMPLOYMENT PROFILE

Total employment, 1984 363,000

Selected characteristics of workers, 1984:
- Percent female 48.2
- Percent black 1.5
- Age distribution (percent):
  - 16-24 years 4.8
  - 25-54 years 70.0
  - 55 and older 25.2
- Percent employed part time, total 17.5
- Percent employed part time, voluntary 12.8

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Real estate agents and managers	80.8
Residential building construction	6.0
Real estate operators and lessors	5.4
Subdividers and developers	5.1

	Low	*Moderate*	*High*
Projected 1995 employment	396,000	415,000	432,000
Percent change, 1984-95	9.1	14.4	19.0

Employment growth ..... Average

Annual separation rate (percent) 18.1

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require real estate agents and brokers to be licensed. Prospective agents must be high school graduates, at least 18 years old, and pass a written test. Most jurisdictions require candidates for the general sales license to complete at least 30 hours of classroom instruction. Brokers must complete 90 hours of formal training and have 1 to 3 years of experience selling real estate.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Real estate 10,010

Associate degrees and other awards below baccalaureate, 1983:
- Real estate 1,586

Characteristics of entrants. This occupation is characterized by a pattern of movement into and out of work, depending on the strength of the housing market, family responsibilities, and other factors. Most entrants have not been working—primarily homemakers and other persons who are attracted by the opportunity to set their own work schedule. Others transfer from a wide variety of occupations. The majority of entrants are age 35 or older and have some postsecondary education; many are college graduates.

Retail sales workers

EMPLOYMENT PROFILE

Total employment, 1984 4,001,000

Selected characteristics of workers, 1984:
- Percent female 69.0
- Percent black 7.3
- Age distribution (percent):
  - 16-24 years 41.0
  - 25-54 years 46.5
  - 55 and older 12.5
- Percent employed part time, total 48.0
- Percent employed part time, voluntary 35.4

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Department stores	22.6
Grocery stores	7.4
Women's ready-to-wear stores	5.4

	Low	*Moderate*	*High*
Projected 1995 employment	4,345,000	4,584,000	4,790,000
Percent change, 1984-95	8.6	14.6	19.7

Employment growth ..... Average

Annual separation rate (percent) 28.9

SUPPLY PROFILE

Usual entry and training requirements. Although there are no formal training requirements, employers generally prefer high school graduates. Although most workers acquire their skills informally on the job, previous sales experience is helpful in finding a job.

Characteristics of entrants. This is primarily an entry level job. The majority of job openings are filled by persons who have not been working, primarily students, full-time homemakers, and unemployed persons. The majority of entrants are under 25 years of age, have little or no work experience, and are attracted by the opportunity to work part time. Those who transfer into the occupation are more likely to be older and to take a full-time job than entrants who have not been working.

Securities and financial services sales workers

EMPLOYMENT PROFILE

Total employment, 1984 81,000

Selected characteristics of workers, 1984:
- Percent female 23.9
- Percent black 2.6
- Age distribution (percent):
  - 16-24 years 12.5
  - 25-54 years 74.5
  - 55 and older 13.0
- Percent employed part time, total 7.4
- Percent employed part time, voluntary 5.8

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Security brokers and dealers	32.7
Commercial and stock savings banks	22.3
Mortgage bankers and brokers	14.6
Personal credit institutions	8.5
Commodity contracts brokers and dealers	6.2
Savings and loan associations	5.3

	Low	Moderate	High
Projected 1995 employment	107,000	113,000	118,000
Percent change, 1984-95	31.7	39.1	44.7

Employment growth ..... Much faster than average

Annual separation rate (percent) 7.5

SUPPLY PROFILE

Usual entry and training requirements. A college education is becoming a requirement for employment. Many employers prefer people who have been successful in other fields, particularly in sales. Self-confidence, good communication skills, and good grooming are required. Securities sales workers must meet licensing requirements, which generally include passing an examination. In addition, they must be registered with the securities exchanges where they do business or with the National Association of Securities Dealers, Inc. Like licensure, registration requires passing the appropriate examination. To keep abreast of new financial products, securities sales workers periodically take training offered by their firms or outside institutions.

Characteristics of entrants. The majority of entrants transfer from another occupation—primarily a professional sales occupation that usually requires a college degree. The others have not been working—many have been in school or between jobs; some are retirees reentering the labor force. The majority are college graduates.

Travel agents

EMPLOYMENT PROFILE

Total employment, 1984 72,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Arrangement of transportation	98.9

	Low	Moderate	High
Projected 1995 employment	98,000	103,000	108,000
Percent change, 1984-95	36.6	43.9	50.0

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. Employers prefer applicants who have taken travel courses; some also prefer college graduates. Travel courses are offered in postsecondary vocational schools, adult education programs in public high schools, community colleges, and 4-year colleges and universities. In some jurisdictions, travel agents must be licensed.

Training completions:

Public vocational secondary and postsecondary, 1983:
Transportation and travel marketing 7,305

Private noncollegiate postsecondary, 1981:
Transportation services 1,069

Associate degrees and other awards below baccalaureate, 1983:
Transportation and travel marketing 2,138

Earned degrees, baccalaureate and above, 1983:
Transportation and travel marketing:
Bachelor's 242

Wholesale trade sales workers

EMPLOYMENT PROFILE

Total employment, 1984 1,248,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Machinery, equipment, and supplies	24.8
Groceries and related products	10.4
Electrical goods	9.6
Motor vehicles and auto parts and supplies	7.6
Miscellaneous nondurable goods (includes farm supplies, tobacco and tobacco products, and paints, varnishes, and supplies)	6.7
Hardware, plumbing, and heating equipment and supplies	5.3

	Low	Moderate	High
Projected 1995 employment	1,536,000	1,617,00	1,688,000
Percent change, 1984-95	23.1	29.6	35.3

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Requirements vary by product line and market. Sales of complex products, such as drugs or computer equipment, require people with a technical background; many employers in these fields require a college degree with a major closely related to the product line being sold. Employers specializing in nontechnical products—food, for example—often consider sales ability and familiarity with manufacturers and brands more important than knowledge of the product itself. Although large wholesale firms often have formal training programs, most trainees learn by assisting experienced workers.

Characteristics of entrants. Most entrants transfer from other occupations—usually from lower level jobs in the same company or from other sales positions. The remainder have not been working—persons who have been laid off, in school, or tending to family responsibilities. Entrants tend to be older than entrants to other occupations, reflecting the importance of prior work experience. The majority of entrants have had some college training, and many have a degree.

Administrative Support Occupations, Including Clerical

Bank tellers

EMPLOYMENT PROFILE

Total employment, 1984 493,000

Selected characteristics of workers, 1984:

Percent female	91.4
Percent black	7.9
Age distribution (percent):	
16-24 years	40.0
25-54 years	54.3
55 and older	5.7
Percent employed part time, total	20.3
Percent employed part time, voluntary	16.4

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Commercial and stock savings banks	70.3
Savings and loan associations	19.2
Mutual savings banks	5.6
Personal credit institutions	4.2

	Low	*Moderate*	*High*
Projected 1995 employment	492,000	517,000	539,000
Percent change, 1984-95	−.2	4.9	9.4

Employment growth ..... Slower than average

Annual separation rate (percent) 22.3

SUPPLY PROFILE

Usual entry and training requirements. Employers generally prefer high school graduates, although few employers have formal educational requirements. Preferred personal qualities include neatness, tact, courtesy, maturity, and attention to detail. Tellers usually acquire their skills through a combination of on-the-job and formal company training.

Characteristics of entrants. The majority of job openings are filled by persons who transfer from another occupation—mostly another clerical job. The remainder have not been working—most have been full-time homemakers, between jobs, or students; almost all entrants are high school graduates.

Bookkeepers and accounting clerks

EMPLOYMENT PROFILE

Total employment, 1984 1,973,000

Selected characteristics of workers, 1984:

Percent female	91.2
Percent black	4.3
Age distribution (percent):	
16-24 years	14.4
25-54 years	68.2
55 and older	17.4
Percent employed part time, total	26.9
Percent employed part time, voluntary	23.1

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Services	23.7
Retail trade	20.8
Finance, insurance, and real estate	11.6
Durable goods manufacturing	7.5
Government	6.9
Wholesale trade, durable goods	6.7
Nondurable goods manufacturing	6.6

	Low	*Moderate*	*High*
Projected 1995 employment	1,990,000	2,091,000	2,178,000
Percent change, 1984-95	0.9	6.0	10.4

Employment growth ..... Slower than average

Annual separation rate (percent) 18.9

SUPPLY PROFILE

Usual entry and training requirements. High school graduates who have taken business arithmetic, bookkeeping, and principles of accounting meet the minimum requirements for most bookkeeping jobs. Increasingly, employers prefer applicants who have completed accounting programs at the community or junior college level or those who have attended business school.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Accounting, bookkeeping, and related programs	105,047
Associate degrees and other awards below the baccalaureate, 1983:	
Accounting, bookkeeping, and related programs	10,287

Characteristics of entrants. About half of all job openings are filled by persons who have not been working—many are full-time homemakers attracted by the opportunity to work part time. The remaining entrants transfer from another occupation. Although many entrants have completed some training beyond high schoool, few are college graduates.

Computer and peripheral equipment operators

EMPLOYMENT PROFILE

Total employment, 1984 311,000

Selected characteristics of workers, 1984:

Percent female	64.7
Percent black	12.8
Age distribution (percent):	
16-24 years	27.8
25-54 years	66.9
55 and older	5.3
Percent employed part time, total	9.4
Percent employed part time, voluntary	7.6

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Computer and data processing services	13.2
Government	10.5
Durable goods manufacturing	10.2
Commercial and stock savings banks	6.8
Wholesale trade	6.2
Nondurable goods manufacturing	5.3
Miscellaneous services (includes engineering, architectural, and surveying services; noncommercial educational, scientific, and research organizations; and accounting, auditing, and bookkeeping services)	5.1

	Low	*Moderate*	*High*
Projected 1995 employment	434,000	454,000	472,000
Percent change, 1984-95	39.3	45.9	51.6

Employment growth ..... Much faster than average
Annual separation rate (percent) 19.3

SUPPLY PROFILE

Usual entry and training requirements. Most employers require computer and peripheral equipment operators to have a high school education, specialized training, or experience. Many employers prefer persons who are familiar with the brand and type of equipment they use. Operators may need additional training to adapt their skills to changes in computer technology.

Training completions:

Public vocational secondary and postsecondary, 1983:
  Business computer and console operation and business data peripheral equipment operation 11,973
Private noncollegiate postsecondary, 1981:
  Computer operator 3,276
Associate degrees and other awards below baccalaureate, 1983:
  Business computer and console operation and business data peripheral equipment operation 1,491

Characteristics of entrants. The majority of entrants transfer from another occupation, such as secretary, typist, bookkeeper, or keypunch operator. The remaining job openings are filled by persons who have been in school, tending to household responsibilities, or between jobs.

Data entry keyers

EMPLOYMENT PROFILE

Total employment, 1984 324,000

Selected characteristics of workers, 1984:
  Percent female 91.3
  Percent black 20.7
  Age distribution (percent):
    16-24 years 23.5
    25-54 years 69.1
    55 and older 7.4
  Percent employed part time, total 11.9
  Percent employed part time, voluntary 9.0

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Computer and data processing services	21.3
Government	11.5
Wholesale and retail trade	9.4
Durable goods manufacturing	9.2
Insurance carriers	6.1
Health services	5.4

	Low	*Moderate*	*High*
Projected 1995 employment	319,000	334,000	347,000
Percent change, 1984-95	−1.6	3.1	7.1

Employment growth ..... Little change

Annual separation rate (percent) 18.4

SUPPLY PROFILE

Usual entry and training requirements. Although many data entry keyers are trained on the job, some employers prefer high school graduates who are familiar with data entry equipment. Many employers test applicants' ability to enter data quickly and accurately.

Training completions:

Public vocational secondary and postsecondary, 1983:
  Business data entry equipment operation 5,066
Private noncollegiate postsecondary, 1981:
  Keypunch operator 7,859
Associate degrees and other awards below baccalaureate, 1983:
  Business data entry equipment operation 1,145

Characteristics of entrants. The majority of entrants transfer from another occupation, such as tabulating and bookkeeping machine operator. The rest have not been working; most have been tending to family responsibilities, in school, or between jobs. Most entrants are young and have a high school diploma or less education.

Mail carriers and postal clerks

EMPLOYMENT PROFILE

Total employment, 1984 598,000

Selected characteristics of workers, 1984:
  Percent female 26.7
  Percent black 19.6
  Age distribution (percent):
    16-24 years 4.3
    25-54 years 80.5
    55 and older 15.2
  Percent employed part time, total 6.4
  Percent employed part time, voluntary 3.7

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
U.S. Postal Service	100.0

	Low	*Moderate*	*High*
Projected 1995 employment	547,000	579,000	617,000
Percent change, 1984-95	−8.4	−3.2	3.2

Employment growth ..... Decline

Annual separation rate (percent) ..... [1]8.9

[1]The number of separations may be artificially high. Employment in the occupation declined between 1983 and 1984; some workers who left were not replaced.

SUPPLY PROFILE

Usual entry and training requirements. Civil service regulations govern the appointment of mail carriers and postal clerks. Applicants must be U.S. citizens or have been granted permanent resident alien status and be at least 18 years old (16 if they have a high school diploma). They must qualify on a written examination that measures speed and accuracy at checking names and numbers and ability to memorize mail distribution procedures; and pass a physical examination. Applicants for mail carrier positions must have a driver's license, a good driving record, and pass a road test. Applicants for postal clerk jobs operating an electronic sorting machine must pass a special examination that includes a machine aptitude test. Vacancies are filled on the basis of how applicants score on these tests.

Characteristics of entrants. About half of all entrants transfer from another occupation in which they worked while waiting to be selected from the list of eligible candidates. The other half have not been working; they are mainly persons who have been laid off or are between jobs, students, or homemakers. Almost half of all entrants have some postsecondary education, but few are college graduates. Most entrants are between the ages of 20 and 34.

Receptionists and information clerks

EMPLOYMENT PROFILE

Total employment, 1984 458,000

Selected characteristics of workers, 1984:

Percent female	94.0
Percent black	7.7
Age distribution (percent):	
16-24 years	32.0
25-54 years	54.2
55 and older	13.8
Percent employed part time, total	33.8
Percent employed part time, voluntary	27.3

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Offices of physicians	18.5
Offices of dentists	9.4
Business services	8.8
Hospitals	8.6
Finance, insurance, and real estate	8.2
Personal services	6.7
Manufacturing	5.0

	Low	*Moderate*	*High*
Projected 1995 employment	512,000	542,000	566,000
Percent change, 1984-95	11.8	18.2	23.6

Employment growth ..... Average

Annual separation rate (percent) 28.5

SUPPLY PROFILE

Usual entry and training requirements. Employers normally require a high school diploma, and courses in English, typing, shorthand, business arithmetic, basic accounting and bookkeeping, and office procedures are recommended. Employers seek people who are outgoing and have a neat appearance, a pleasant voice, and an even disposition. Many entry level receptionist jobs do not require office or business experience.

Training completions:

Public vocational secondary and postsecondary, 1983:

Receptionist and communication systems operation	1,576

Characteristics of entrants. About half of all enrants transfer from another occupation. The remainder have not been working—most were tending to family responsibilities or in school. Although most entrants are high school graduates, few have a college degree.

Reservation and transportation ticket agents and travel clerks

EMPLOYMENT PROFILE

Total employment, 1984 109,000

Selected characteristics of workers, 1984:

Percent female	59.9
Percent black	9.5
Age distribution (percent):	
16-24 years	21.9
25-54 years	67.9
55 and older	10.2
Percent employed part time, total	12.9
Percent employed part time, voluntary	8.9

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Certified air transportation	82.8

	Low	*Moderate*	*High*
Projected 1995 employment	111,000	116,000	121,000
Percent change, 1984-95	2.3	6.3	11.2

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Employers generally require a high school diploma; some prefer postsecondary training. Previous experience in dealing with the public and prior employment in the transportation industry are viewed favorably by employers. A good appearance, a pleasant personality, and a good speaking voice are assets. Reservation agents and ticket clerks usually acquire their skills on the job or through formal company programs.

Characteristics of entrants. The majority of entrants are individuals in their twenties who transfer from another occupation. The remaining entrants have not been working—mainly they have been tending to family responsibilities, in school, or on temporary layoff. Over half of all job openings are filled by individuals who have attended college, including many college graduates. Relatively few entrants take a part-time job.

Secretaries

EMPLOYMENT PROFILE

Total employment, 1984 2,797,000

Selected characteristics of workers, 1984:

Percent female	98.3
Percent black	6.1
Age distribution (percent):	
16-24 years	19.5
25-54 years	68.2
55 and older	12.3
Percent employed part time, total	17.1
Percent employed part time, voluntary	13.9

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	11.5
Finance, insurance, and real estate	11.1
Health services	9.2
Durable goods manufacturing	9.1
Government	8.6
Wholesale trade	6.6
Business services	6.0

	Low	Moderate	High
Projected 1995 employment	2,928,000	3,064,000	3,186,000
Percent change, 1984-95	4.7	9.6	13.9

Employment growth ..... Slower than average

Annual separation rate (percent) 15.5

SUPPLY PROFILE

Usual entry and training requirements. Most employers seek high school graduates who have mastered basic office skills such as typing. Although formal postsecondary training usually is not required, it often is an asset, particularly familiarity with word processing equipment. Shorthand also is needed for some jobs. Formal training is available through secretarial courses offered by postsecondary vocational schools and community colleges. Some workers develop these higher level skills informally on the job.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Secretarial and related programs 139,013

Private noncollegiate postsecondary, 1981:
- Stenographic-secretarial 62,486

Characteristics of entrants. The majority of openings are filled by people who have not been working. Although some of these entrants have been in school or between jobs, most have been full-time homemakers. The remaining openings are filled by individuals who transfer from another occupation. The majority of entrants are between the ages of 25 and 54. Many positions are filled by people who have attended college.

Statistical clerks

EMPLOYMENT PROFILE

Total employment, 1984 93,000

Selected characteristics of workers, 1984:
- Percent female 75.4
- Percent black 10.6
- Age distribution (percent):
  - 16-24 years 14.0
  - 25-54 years 72.6
  - 55 and older 13.4
- Percent employed part time, total 13.9
- Percent employed part time, voluntary 11.5

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Business services	21.5
Miscellaneous business services (includes research and development laboratories; management, consulting, and public relations services; and commercial testing laboratories)	18.2
Telephone communications	16.8
Hospitals	8.1
Insurance carriers	6.3
State government	6.1
Educational services	5.8
Local government	5.7

	Low	Moderate	High
Projected 1995 employment	78,000	81,000	84,000
Percent change, 1984-95	−16.4	−12.7	−9.3

Employment growth ..... Decline

SUPPLY PROFILE

Usual entry and training requirements. High school graduates with an aptitude for working with numbers and the ability to do detailed work meet the minimum requirements for most jobs. Courses in general mathematics, algebra, geometry, data processing, office procedures, bookkeeping, and typing are useful.

Characteristics of entrants. Most entrants to this occupation transfer from another occupation. For the most part, the remaining entrants are homemakers or students. The majority of entrants are in their twenties or early thirties, and many have attended college.

Stenographers

EMPLOYMENT PROFILE

Total employment, 1984 239,000

Selected characteristics of workers, 1984:
- Percent female 86.6
- Percent black 7.9
- Age distribution (percent):
  - 16-24 years 10.2
  - 25-54 years 75.4
  - 55 and older 14.4
- Percent employed part time, total 13.0
- Percent employed part time, voluntary 11.2

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Educational services	15.9
State government	15.4
Finance, insurance, and real estate	12.0
Transportation, communications, and utilities	8.1
Local government	7.5
Durable goods manufacturing	6.2
Personnel supply services	5.6

	Low	Moderate	High
Projected 1995 employment	138,000	143,000	148,000
Percent change, 1984-95	−42.5	−40.3	−38.3

Employment growth ..... Decline

SUPPLY PROFILE

Usual entry and training requirements. Employers require applicants to be able to take dictation in shorthand at a certain speed and with a certain degree of accuracy. Applicants for court reporter jobs should know how to use a stenotype machine. Some States require court reporters to be certified. Many acquire their skills through courses taught in high school, postsecondary vocational schools, and community colleges; others, through on-the-job training.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Secretarial and related programs 82,972

Private noncollegiate postsecondary, 1981:
- Stenographic-secretarial 62,486

Characteristics of entrants. The majority of entrants transfer from other occupations. The remainder have not been working because they were tending to family responsibilities, in school, or

unemployed. Over half have attended college, but relatively few are college graduates. Most entrants are in their twenties or early thirties.

Teacher aides

EMPLOYMENT PROFILE

Total employment, 1984 479,000

Selected characteristics of workers, 1984:
- Percent female 93.0
- Percent black 18.7
- Age distribution (percent):
  - 16-24 years 13.7
  - 25-54 years 73.6
  - 55 and older 12.7
- Percent employed part time, total 51.7
- Percent employed part time, voluntary 36.7

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	81.8
Child day care services	10.9

	Low	*Moderate*	*High*
Projected 1995 employment	548,000	566,000	586,000
Percent change, 1984-95	14.6	18.3	22.4

Employment growth ..... Average

Annual separation rate (percent) 22.3

SUPPLY PROFILE

Usual entry and training requirements. Educational requirements vary widely. Some school districts do not require a high school diploma; others require some college training or work experience. Jobs with classroom responsibilities usually require more education than those that are primarily clerical or monitoring in nature. A few States have certification procedures for general teacher aides.

Characteristics of entrants. The majority of job openings are filled by persons who have not been working—primarily homemakers attracted by the opportunity to work part time. Others have been in school or working in another occupation. An unusually large proportion are over 35 years of age.

Telephone operators

EMPLOYMENT PROFILE

Total employment, 1984 456,000

Selected characteristics of workers, 1984:
- Percent female 92.8
- Percent black 17.6
- Age distribution (percent):
  - 16-24 years 22.5
  - 25-54 years 60.4
  - 55 and older 17.1
- Percent employed part time, total 17.3
- Percent employed part time, voluntary 13.0

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Telephone communication	24.0
Miscellaneous business services (includes management, consulting, and public relations services; research and development laboratories; telephone message services; and related services)	11.4
Finance, insurance, and real estate	10.8
Hospitals	7.3
Manufacturing	5.7
Retail trade	5.2

	Low	*Moderate*	*High*
Projected 1995 employment	519,000	545,000	568,000
Percent change, 1984-95	13.8	19.5	24.5

Employment growth ..... Average

Annual separation rate (percent) 20.4

SUPPLY PROFILE

Usual entry and training requirements. Employers prefer applicants who are pleasant, courteous, good listeners, and who have good reading, spelling, and arithmetic skills. Although hiring practices vary from company to company, almost all require a high school diploma. Businesses prefer to hire telephone operators with previous office experience. However, work experience is not as important in telephone companies, because these companies conduct extensive training programs for their operators.

Characteristics of entrants. Entrants are about equally divided between those who have not been working and those who transfer from another occupation. Of those who have not been working, most have been students or full-time homemakers. Almost all entrants have a high school diploma.

Traffic, shipping, and receiving clerks

EMPLOYMENT PROFILE

Total employment, 1984 651,000

Selected characteristics of workers, 1984:
- Percent female 25.2
- Percent black 13.7
- Age distribution (percent):
  - 16-24 years 25.3
  - 25-54 years 64.2
  - 55 and older 10.5
- Percent employed part time, total 9.1
- Percent employed part time, voluntary 6.0

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Durable goods manufacturing	17.2
Nondurable goods manufacturing	17.1
Services	6.3
Wholesale trade, groceries and related products	6.2
Wholesale trade; machinery, equipment, and supplies	5.8
Transportation	5.2
General merchandise stores	5.2

	Low	*Moderate*	*High*
Projected 1995 employment	676,000	711,000	742,000

	Low	Moderate	High
Percent change, 1984-95	3.9	9.3	14.0

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. High school graduation is usually required for beginning jobs. Employers prefer applicants who have taken business arithmetic, typing, and other high school business subjects, and who can write legibly and keep orderly records. New employees usually are trained on the job by an experienced worker.

Characteristics of entrants. Many traffic, shipping, and receiving clerks face periodic layoff during economic downturns. Consequently, most job entrants have been on temporary layoff, between jobs, or working in another occupation. Others have been in school. Few entrants have more than a high school diploma. In contrast to other clerical workers, many of whom work part time, traffic, shipping, and receiving clerks generally have full-time jobs.

Typists

EMPLOYMENT PROFILE

Total employment, 1984 991,000

Selected characteristics of workers, 1984:

Percent female	95.7
Percent black	16.1
Age distribution (percent):	
16-24 years	29.8
25-54 years	59.2
55 and older	11.0
Percent employed part time, total	23.6
Percent employed part time, voluntary	19.4

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Local government	9.9
State government	9.1
Educational services	8.4
Federal Government	7.5
Personnel supply services	6.5
Hospitals	6.0
Insurance carriers	5.3

	Low	Moderate	High
Projected 1995 employment	962,000	1,002,000	1,038,000
Percent change, 1984-95	−2.9	1.1	4.7

Employment growth ..... Little change

Annual separation rate (percent) 23.2

SUPPLY PROFILE

Usual entry and training requirements. Employers usually require high school graduation and a certain typing speed. An increasing number also require word processing training or experience. Skills may be obtained through classes taught in high schools, postsecondary vocational schools, community colleges, and home study schools. Spelling, punctuation, and grammar skills are important, and familiarity with standard office equipment and procedures is an asset.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Typing, general office, and related programs, general; and clerk-typist	146,421
Private noncollegiate postsecondary, 1981:	
Typing and related occupations	7,278
Associate degrees and other awards below baccalaureate, 1983:	
Typing, general office, and related programs; and clerk-typist	3,349

Characteristics of entrants. The majority of openings are filled by people who have not been working, primarily homemakers, full-time students, and persons between jobs. The remaining entrants transfer from another occupation. Because this occupation offers very good opportunities for young, inexperienced workers, a substantial proportion of entrants are teenagers.

Service Occupations

Barbers

EMPLOYMENT PROFILE

Total employment, 1984 94,000

Selected characteristics of workers, 1984:

Percent female	19.2
Percent black	10.1
Age distribution (percent):	
16-24 years	4.5
25-54 years	65.6
55 and older	29.9
Percent employed part time, total	15.0
Percent employed part time, voluntary	12.4

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Beauty shops	47.7
Barber shops	44.3

	Low	Moderate	High
Projected 1995 employment	94,000	98,000	104,000
Percent change, 1984-95	−.1	4.5	10.0

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require barbers to be licensed. In general, applicants must graduate from an approved barber school or apprenticeship program and be at least 16 years old. Some jurisdictions also require a high school diploma. Patience, good health, and physical stamina are necessary.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Barbering	751
Private noncollegiate postsecondary, 1981:	
Barbering	9,927

Characteristics of entrants. Most entrants have not been working—most are recent graduates of barber schools, or licensed but inactive barbers who have been between jobs or tending to family responsibilities. The remainder transfer from another occupation. Almost half of all entrants are 35 to 54 years of age.

Bartenders

EMPLOYMENT PROFILE

Total employment, 1984 400,000

Selected characteristics of workers, 1984:

Percent female	48.9
Percent black	2.5
Age distribution (percent):	
16-24 years	25.3
25-54 years	65.1
55 and older	9.6
Percent employed part time, total	30.4
Percent employed part time, voluntary	18.1

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Eating and drinking places	72.2
Hotels, motels, and tourist courts	9.8
Civic, social, and fraternal associations	9.4

	Low	*Moderate*	*High*
Projected 1995 employment	489,000	512,000	535,000
Percent change, 1984-95	22.2	27.9	33.6

Employment growth ..... Faster than average

Annual separation rate (percent) 32.2

SUPPLY PROFILE

Usual entry and training requirements. Bartenders must be at least 21 years of age, although some employers prefer to hire persons at least 25 years old. Also, employers prefer those with a pleasant personality and a neat and clean appearance. Most bartenders learn the trade on the job. However, skills also may be acquired through courses at vocational schools, working with a bartender in a related occupation such as waiter or waitress, or by preparing drinks at home.

Characteristics of entrants. The majority of entrants have not been working, mostly persons who have been unemployed or tending to family responsibilities. The remainder transfer from another occupation, mainly a related occupation such as cook, bartender's helper, waiter or waitress, or bartender's assistant. Most entrants are under 35 years of age.

Chefs and cooks, except short order

EMPLOYMENT PROFILE

Total employment, 1984 884,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Eating and drinking places	41.1
Educational services	29.7
Health services	9.0
Hotels, motels, and tourist courts	5.9

	Low	*Moderate*	*High*
Projected 1995 employment	1,050,000	1,095,000	1,140,000
Percent change, 1984-95	18.7	23.8	28.9

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Skills are acquired primarily through work experience, either as an assistant cook or fry cook or in a related occupation, such as short-order cook or food preparation worker. Formal training in commercial food preparation, available from colleges and universities and vocational schools, is an acceptable substitute for experience and is an advantage in competing for jobs in large restaurants and hotels. High school graduation usually is a prerequisite for postsecondary training, although it is not required for entry level jobs.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Chef/cook	2,656
Private noncollegiate postsecondary, 1981:	
Quantity food occupations	3,401
Associated degrees and other awards below the baccalaureate, 1983:	
Chef/cook	1,222

Characteristics of entrants. The typical entrant is 25 years of age or younger and starts as a part-time employee, seeking a source of immediate income rather than a career. Although some transfer from another occupation, many entrants have not been working—they have been in school, unemployed, or tending to household responsibilities.

Childcare workers

EMPLOYMENT PROFILE

Total employment, 1984 572,000

Selected characteristics of workers, 1984:

Percent female	97.4
Percent black	9.5
Age distribution (percent):	
16-24 years	21.3
25-54 years	63.6
55 and older	15.1
Percent employed part time, total	40.2
Percent employed part time, voluntary	29.8

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Child day care services	40.5
Residential care	16.6
Religious organizations	10.6
Government	7.2
Individual and family social services	5.5

	Low	Moderate	High
Projected 1995 employment ..	596,000	626,000	651,000
Percent change, 1984-95	4.2	9.5	13.9

Employment growth ..... Slower than average

Annual separation rate (percent) 35.9

SUPPLY PROFILE

Usual entry and training requirements. Although no special education or experience is required for most jobs, employers may prefer individuals with a high school diploma and previous experience caring for children. Most acquire skills on the job.

Characteristics of entrants. Most entrants have not been working—primarily persons tending to household responsibilities. Many entrants seek flexible work schedules, and the majority take part-time jobs. Relatively few entrants have any formal training beyond high school.

Correction officers

EMPLOYMENT PROFILE

Total employment, 1984 130,000

Selected characteristics of workers, 1984:

Percent female	17.6
Percent black	26.3
Age distribution (percent):	
16-24 years	19.1
25-54 years	71.0
55 and older	9.9
Percent employed part time, total	.9
Percent employed part time, voluntary	.7

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
State government	61.1
Local government	35.6

	Low	Moderate	High
Projected 1995 employment ..	171,000	175,000	180,000
Percent change, 1984-95	31.4	34.9	38.3

Employment growth ..... Much faster than average

Annual separation rate (percent) 15.7

SUPPLY PROFILE

Usual entry and training requirements. Most institutions require that correction officers be at least 18 years old and have a high school diploma or its equivalent or qualifying work experience. Employers increasingly prefer applicants who have had postsecondary training in psychology, criminology, and related fields. Entrants must be in good health; many jurisdictions require candidates to meet formal standards of physical fitness, eyesight, and hearing. Strength, good judgment, and the ability to think and act quickly are assets. A few jurisdictions require canidates to pass a written examination. Most correction officers receive their training at government-operated academies and informally on the job by working with an experienced officer.

Characteristics of entrants. Entrants are about equally divided between those who transfer from another occupation and those who have not been working while awaiting appointment. Almost all entrants are high school graduates, and many have postsecondary training. Most entrants are between 20 and 34 years of age.

Cosmetologists and related workers

EMPLOYMENT PROFILE

Total employment, 1984 524,000

Selected characteristics of workers, 1984:

Percent female	89.8
Percent black	7.5
Age distribution (percent):	
16-24 years	21.0
25-54 years	66.6
55 and older	12.4
Percent employed part time, total	38.9
Percent employed part time, voluntary	28.4

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Beauty shops	89.8
Department stores	5.5

	Low	Moderate	High
Projected 1995 employment ..	639,000	674,000	704,000
Percent change, 1984-95	22.1	28.7	34.4

Employment growth ..... Faster than average

Annual separation rate (percent) 10.3

SUPPLY PROFILE

Usual entry and training requirements. All States and the District of Columbia require cosmetologists to be licensed. Candidates for licensure must graduate from an approved cosmetology school, pass a physical examination, and be at least 16 years old. Some jurisdictions will accept completion of apprenticeship training in lieu of graduation from cosmetology school, but very few cosmetologists learn their skills that way.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Cosmetology	35,662
Private noncollegiate postsecondary, 1981:	
Cosmetology	113,179

Characteristics of entrants. The majority of job openings are filled by persons who have not been working—either recently licensed cosmetologists or persons from the reserve pool of licensed but

inactive cosmetologists who have been tending to family responsibilities or not working for other reasons. The remainder transfer from another occupation. Individuals with no formal education beyond high school fill most cosmetology jobs. An unusually large proportion of entrants take a part-time position.

Dental assistants

EMPLOYMENT PROFILE

Total employment, 1984 169,000

Selected characteristics of workers, 1984:

Percent female	98.2
Percent black	4.4
Age distribution (percent):	
16-24 years	39.1
25-54 years	56.8
55 and older	4.1
Percent employed part time, total	42.8
Percent employed part time, voluntary	35.6

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Offices of dentists	95.3

	Low	*Moderate*	*High*
Projected 1995 employment	204,000	217,000	226,000
Percent change, 1984-95	20.5	28.4	33.6

Employment growth ..... Faster than average

Annual separation rate (percent) 16.4

SUPPLY PROFILE

Usual entry and training requirements. This is an entry level job with no formal academic requirements. An ability to learn the job and a congenial personality are sufficient for most jobs, because employers generally provide informal, on-the-job training. Some persons are trained in dental assisting programs offered by community and junior colleges, postsecondary vocational schools, or the Armed Forces.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Dental assisting 8,073

Private noncollegiate postsecondary, 1981:
- Dental assistant 7,354

Associate degrees and other awards below baccalaureate, 1983:
- Dental assisting 3,274

Characteristics of entrants. Entrants are about equally divided between those who have not been working and those who transfer from another occupation. Of those who have not been working, most have been tending to family responsibilities or were in school. Almost half of all entrants take part-time positions.

Firefighting occupations

EMPLOYMENT PROFILE

Total employment, 1984 308,000

Selected characteristics of workers, 1984:

Percent female	0.7
Percent black	5.3
Age distribution (percent):	
16-24 years	7.8
25-54 years	84.8
55 and older	7.4
Percent employed part time, total	1.6
Percent employed part time, voluntary	.7

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Local government	94.1

	Low	*Moderate*	*High*
Projected 1995 employment	347,000	356,000	365,000
Percent change, 1984-95	12.7	15.6	18.6

Employment growth ..... Average

Annual separation rate (percent) ..... [1]3.8

[1]The number of separations may be artificially high. Employment in the occupation declined between 1983 and 1984; some workers who left were not replaced.

SUPPLY PROFILE

Usual entry and training requirements. Applicants must be at least 18 years old and have a high school diploma. They also may have to pass a written test, a medical examination, and tests of strength, physical stamina, and agility. Experience as a volunteer firefighter or in the Armed Forces and completion of community or junior college courses in fire science may improve applicants' chances for appointment.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Fire protection 16,637

Private noncollegiate postsecondary, 1981:
- Fire and fire safety technology and firefighter training. 1,870

Associate degrees and other awards below baccalaureate, 1983:
- Fire protection 2,559

Characteristics of entrants. The majority of entrants transfer from a job in another occupation held while waiting for an appointment. The remainder have not been working—most have been between jobs, in school, or in military service. Almost all entrants are high school graduates, and the majority have some postsecondary education. Virtually all entrants are between the ages of 20 and 34.

Flight attendants

EMPLOYMENT PROFILE

Total employment, 1984 65,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Certified air transportation	95.9

	Low	*Moderate*	*High*
Projected 1995 employment	74,000	77,000	81,000
Percent change, 1984-95	15.5	20.0	25.8

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Flight attendants must have a high school diploma and complete a 4- to 6-week company training program. They must be in good physical condition. They should have an attractive appearance, be poised, and be able to deal comfortably with strangers. Some employers prefer those with college training or experience in dealing with the public. In addition, attendants must take 12 hours of training each year in emergency procedures and passenger relations.

Guards

EMPLOYMENT PROFILE

Total employment, 1984 733,000

Selected characteristics of workers, 1984:

Percent female	13.9
Percent black	19.2
Age distribution (percent):	
16-24 years	20.7
25-54 years	54.3
55 and older	25.0
Percent employed part time, total	20.1
Percent employed part time, voluntary	13.6

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Miscellaneous business services (includes detective agencies and protective and related services)	52.3
Durable goods manufacturing	6.2
Real estate	6.1
Educational services	5.7

	Low	*Moderate*	*High*
Projected 1995 employment	879,000	921,000	958,000
Percent change, 1984-95	19.9	25.6	30.6

Employment growth ..... Faster than average

Annual separation rate (percent) 22.0

SUPPLY PROFILE

Usual entry and training requirements. Most employers prefer high school graduates with military, State, or local police experience. Although there are no formal educational requirements, applicants may be tested for reading and writing ability. Some jobs require a driver's permit. Applicants are expected to be physically fit, have good character references, and not have a police record.

Characteristics of entrants. Many entrants have not been working—most have been unemployed, retired, in school, or in military service. Others have transferred from another occupation—some are former police officers or other protective service workers. Because of limited formal training requirements and flexible hours, this occupation attracts many persons seeking a second job. The majority of entrants have a high school diploma or less education.

Janitors and cleaners

EMPLOYMENT PROFILE

Total employment, 1984 2,940,000

Selected characteristics of workers, 1984:

Percent female	39.7
Percent black	24.7
Age distribution (percent):	
16-24 years	23.5
25-54 years	55.1
55 and older	21.4
Percent employed part time, total	32.6
Percent employed part time, voluntary	20.0

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Educational services	19.5
Services to dwellings and other buildings	16.6
Hotels, motels, and tourist courts	11.1
Retail trade	7.2
Hospitals	6.9
Real estate	5.8

	Low	*Moderate*	*High*
Projected 1995 employment	3,233,000	3,383,000	3,522,000
Percent change, 1984-95	10.0	15.1	19.8

Employment growth ..... Average

Annual separation rate (percent) 23.3

SUPPLY PROFILE

Usual entry and training requirements. No special education is required for most jobs, but beginners should know basic arithmetic and be able to follow instructions. Most acquire skills informally on the job.

Characteristics of entrants. The majority of entrants have not been working; they have been unemployed, full-time students, homemakers, or retired. The remaining entrants transfer from another occupation. A relatively large proportion are 19 or younger and 55 or older. More than half take a part-time position. Fewer than half are high school graduates.

Medical assistants

EMPLOYMENT PROFILE

Total employment, 1984 128,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Offices of physicians	63.0
Hospitals	14.4
Offices of other health practitioners (includes offices of chiropractors, podiatrists, and optometrists)	8.8

	Low	*Moderate*	*High*
Projected 1995 employment	195,000	207,000	216,000
Percent change, 1984-95	52.7	62.0	69.1

Employment growth ..... Much faster than average

SUPPLY PROFILE

Usual entry and training requirements. Many medical assistants are trained on the job. Increasingly, employers prefer applicants who have completed training programs offered by high schools, postsecondary vocational schools, community and junior colleges, and universities. A high school diploma normally is required, and applicants should have good communication skills and manual dexterity.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Medical assisting 6,099

Private noncollegiate postsecondary, 1981:
- Medical assisting (office) 15,035

Associate degrees and other awards below baccalaureate, 1983:
- Medical assisting 3,786

Nursing aides and psychiatric aides

EMPLOYMENT PROFILE

Total employment, 1984 1,268,000

Selected characteristics of workers, 1984:
- Percent female 90.4
- Percent black 29.0
- Age distribution (percent):
  - 16-24 years 19.6
  - 25-54 years 65.3
  - 55 and older 15.1
- Percent employed part time, total 26.1
- Percent employed part time, voluntary 17.9

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Nursing and personal care facilities	40.3
Hospitals	34.0
Government	8.8

	Low	*Moderate*	*High*
Projected 1995 employment	1,567,000	1,621,000	1,693,000
Percent change, 1984-95	23.6	27.8	33.5

Employment growth ..... Faster than average

Annual separation rate (percent) ..... [1]21.7

[1]The number of separations may be artificially high. Employment in the occupation declined between 1983 and 1984; some workers who left were not replaced.

SUPPLY PROFILE

Usual entry and training requirements. Employers prefer to hire high school graduates, but a diploma is not always required. Previous work experience ordinarily is not needed. Many aides acquire their skills informally on the job or through formal in-service training programs. Many jurisdictions require nursing aides to be certified. To become certified, candidates must pass an approved course of instruction from an approved school.

Characteristics of entrants. The majority of entrants have not been working—most have been tending to family responsibilities, unemployed, or in school. The remainder transfer from another occupation. The majority of all entrants have a high school education or less.

Police and detectives

EMPLOYMENT PROFILE

Total employment, 1984 520,000

Selected characteristics of workers, 1984:
- Percent female 7.5
- Percent black 11.4
- Age distribution (percent):
  - 16-24 years 7.6
  - 25-54 years 87.4
  - 55 and older 5.0
- Percent employed part time, total 1.1
- Percent employed part time, voluntary 7

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Local government	83.1
State government	11.5
Federal Government	5.5

	Low	*Moderate*	*High*
Projected 1995 employment	572,000	586,000	600,000
Percent change, 1984-95	9.9	12.6	15.4

Employment growth ..... Average

Annual separation rate (percent) 5.6

SUPPLY PROFILE

Usual entry and training requirements. Civil service regulations govern the appointment of police officers and detectives in most jurisdictions. Appointment depends on performance in competitive written examinations, as well as experience and education. Applicants must be U.S. citizens, usually at least 21 years old, and meet rigorous physical and personal qualifications. In most police departments, a high school education is required. Prospects for appointment are improved by related work experience or by completion of an associate or bachelor's degree program in police science or administration of justice.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Criminal justice 19,832

Private noncollegiate postsecondary, 1983:
- Police science technology and law enforcement training 1,042

Armed Forces enlisted strength, 1985:
- Law enforcement 45,145

Associate degrees and other awards below baccalaureate, 1983:
- Criminal justice 12,947

Earned degrees, baccalaureate and above, 1983:
- Criminal justice:
  - Bachelor's 12,327
  - Master's 1,117
  - Ph.D. 38

Characteristics of entrants. The majority of entrants transfer from another occupation—some have worked in a field related to law enforcement; many others transfer from a job held temporarily while waiting to be selected from the list of eligible candidates. The remaining entrants were between jobs, in military service, or in school. Almost all entrants are high school graduates, and many have some postsecondary training. The vast majority of all entrants are between the ages of 20 and 34.

Waiters and waitresses

EMPLOYMENT PROFILE

Total employment, 1984 1,625,000

Selected characteristics of workers, 1984:

Percent female	86.3
Percent black	4.9
Age distribution (percent):	
16-24 years	48.2
25-54 years	46.2
55 and older	5.6
Percent employed part time, total	55.5
Percent employed part time, voluntary	38.8

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Eating and drinking places	78.9
Hotels and other lodging places	10.4

	Low	*Moderate*	*High*
Projected 1995 employment	1,953,000	2,049,000	2,142,000
Percent change, 1984-95	20.2	26.1	31.8

Employment growth ..... Faster than average

Annual separation rate (percent) 32.5

SUPPLY PROFILE

Usual entry and training requirements. Many waiters and waitresses acquire their skills informally on the job, but experience is needed for jobs at restaurants and hotels that emphasize formal dining. Important personal qualities include a pleasant personality, an even disposition, a neat and clean appearance, a good memory, and physical stamina.

Characteristics of entrants. The majority of job openings are filled by persons who have not been working—students, those laid off from another job, and homemakers. Other entrants transfer from another occupation—some advance from a related job as a waiter's assistant, carhop, or food counter worker. Many entrants are less than 25 years of age, and few have more than a high school education. Many entrants to these jobs seek a source of immediate income rather than a career; the majority take a part-time job.

Agricultural, Forestry, and Fishing Occupations

Farm operators and managers

EMPLOYMENT PROFILE

Total employment, 1984 1,442,000

Selected characteristics of workers, 1984:

Percent female	12.5
Percent black	1.0
Age distribution (percent):	
16-24 years	6.8
25-54 years	57.6
55 and older	35.8
Percent employed part time, total	14.4
Percent employed part time, voluntary	12.3

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Agricultural production, crops	58.1
Agricultural production, livestock	35.3
Agricultural services	6.3

	Low	*Moderate*	*High*
Projected 1995 employment	1,315,000	1,380,000	1,432,000
Percent change, 1984-95	−8.8	−4.3	−.8

Employment growth ..... Decline

Annual separation rate (percent) ..... [1]13.4

[1]The number of separations may be artificially high. Employment in the occupation declined between 1983 and 1984; some workers who left were not replaced.

SUPPLY PROFILE

Usual entry and training requirements. Although working on a family farm and participating in programs sponsored by agricultural associations have in the past been sufficient training, it is increasingly necessary to have formal training in agricultural science. An undergraduate degree in agriculture is needed for those without farm experience. In addition, farm managers and operators must continue to study and train to keep abreast of advances in farming methods.

Characteristics of entrants. Entrants tend to be older than entrants to other occupations—the majority are 35 years of age or older—reflecting the need for farm or other business experience. The majority of all entrants have not been working, primarily persons who have been tending to family responsibilities, retired, or in school. Most of the remainder transfer from a farm-related occupation.

Mechanics and Repairers

Aircraft mechanics and engine specialists

EMPLOYMENT PROFILE

Total employment, 1984 106,000

Selected characteristics of workers, 1984:

Percent female	2.4
Percent black	4.3
Age distribution (percent):	
16-24 years	7.5
25-54 years	81.0
55 and older	11.5
Percent employed part time, total	.8
Percent employed part time, voluntary	.4

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Certified air transportation	39.8
Federal Government	26.6
Aircraft and parts	12.3
Air transportation facilities and services	10.0

	Low	Moderate	High
Projected 1995 employment ..	122,000	125,000	128,000
Percent change, 1984-95	14.3	17.3	20.7

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Aircraft mechanics must be licensed. Requirements for licensure include high school graduation or the equivalent and the completion of a vocational program certified by the Federal Aviation Administration, training in the Armed Forces, or appropriate work experience. Mechanical aptitude, strength, and agility are also necessary. Regardless of background, mechanics must continue to participate in employer- or manufacturer-sponsored training programs in order to stay abreast of changes in technology.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Aircraft mechanics 3,607

Private noncollegiate postsecondary, 1981:
- Aircraft maintenance 1,992

Associate degrees and other awards below baccalaureate, 1983:
- Aircraft mechanics 2,224

Characteristics of entrants. Almost all entrants are recent graduates of a formal training program or trained mechanics who have left the Armed Forces. Relatively few job openings are filled by persons transferring from another occupation.

Automotive and motorcycle mechanics

EMPLOYMENT PROFILE

Total employment, 1984 922,000

Selected characteristics of workers, 1984:
- Percent female 0.8
- Percent black 8.1
- Age distribution (percent):
  - 16-24 years 24.5
  - 25-54 years 67.1
  - 55 and older 8.4
- Percent employed part time, total 7.5
- Percent employed part time, voluntary 3.3

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Motor vehicle dealers (new and used)	27.0
Automobile repair shops	15.3
Gasoline service stations	10.1
Auto and home supply stores	6.0
Machinery, equipment, and supplies wholesalers ...	5.9

	Low	Moderate	High
Projected 1995 employment ..	1,052,000	1,107,000	1,154,000
Percent change, 1984-95	14.2	20.1	25.2

Employment growth ..... Faster than average

Annual separation rate (percent) 13.8

SUPPLY PROFILE

Usual entry and training requirements. Employers prefer entrants with mechanical aptitude and knowledge of automotive or motorcycle technology. Skills may be acquired through work experience as a helper or lubrication worker, but completion of a formal training program in automotive or motorcycle mechanics is increasingly preferred to experience alone. Such programs are offered by high school and postsecondary vocational schools and community and junior colleges. For those without experience, training acquired while helping friends or through working on automobiles or motorcycles as a hobby also can be helpful in getting a job.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Automotive mechanics, automotive technology, and small engine repair 84,113

Private noncollegiate postsecondary, 1981:
- Auto mechanic 13,862

Associate degrees and other awards below baccalaureate, 1983:
- Automotive technology, automotive mechanics, and small engine repair 8,776

Characteristics of entrants. The majority of entrants have not been working—most have been in a formal training program, or were experienced mechanics who had been laid off or between jobs. The remainder have been working in another occupation, mostly as a helper or garage attendant or in a related mechanic occupation. Most entrants are high school graduates.

Automotive body repairers

EMPLOYMENT PROFILE

Total employment, 1984 183,000

Selected characteristics of workers, 1984:
- Percent female 2.1
- Percent black 4.4
- Age distribution (percent):
  - 16-24 years 28.0
  - 25-54 years 63.9
  - 55 and older 8.1
- Percent employed part time, total 8.5
- Percent employed part time, voluntary 4.2

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Automobile repair shops	54.9
Motor vehicle dealers (new and used)	34.3

	Low	Moderate	High
Projected 1995 employment ..	204,000	215,000	224,000
Percent change, 1984-95	11.4	17.5	22.3

Employment growth ..... Average

Annual separation rate (percent) 13.5

SUPPLY PROFILE

Usual entry and training requirements. Work experience as an automotive body repairer helper generally is required. Completion of a formal apprenticeship or a training program offered by high schools, postsecondary vocational schools, and community or

junior colleges can shorten the time spent as a helper. Training obtained while helping friends or relatives repair automotive bodies also may be helpful. Manual dexterity and good physical condition are required.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Automotive body repair	22,324
Private noncollegiate postsecondary, 1981:	
Body and fender repair	5,330
Associate degrees and other awards below baccalaureate, 1983:	
Automotive body repair	1,933

Characteristics of entrants. The majority of job openings are filled by former helpers. The remaining entrants have recently completed a training program or have been between jobs. Most entrants have a high school diploma or less education, and more than half are between 20 and 34 years of age.

Commercial and industrial electronic equipment repairers

EMPLOYMENT PROFILE

Total employment, 1984 56,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Federal Government	49.5
Telephone communication	13.8
Air transportation	7.0
Communication equipment manufacturing	6.7

	Low	*Moderate*	*High*
Projected 1995 employment	62,000	64,000	66,000
Percent change, 1984-95	11.1	14.4	17.6

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Workers generally develop their skills informally on the job or through a formal apprenticeship program. Most employers require applicants to have completed 1 to 2 years of postsecondary training in basic electronics. Basic electronics training offered by the Armed Forces also is considered excellent training. Repairers need good color vision, manual dexterity, and good eye-hand coordination.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Electrical and electronics equipment repair and industrial equipment maintenance and repair	35,571

Characteristics of entrants. Typical entrants are recent graduates of postsecondary programs in electronics or persons who have been trained in the Armed Forces. Others transfer from a related occupation such as electronic home entertainment equipment repairer, home appliance and power tool repairer, or precision instrument repairer.

Communications equipment mechanics

EMPLOYMENT PROFILE

Total employment, 1984 73,000

Selected characteristics of workers, 1984:	
Percent female	3.1
Percent black	9.4
Age distribution (percent):	
16-24 years	21.2
25-54 years	64.6
55 and older	14.2
Percent employed part time, total	8.2
Percent employed part time, voluntary	5.2

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Telephone communication	79.7
Railroad transportation	9.4

	Low	*Moderate*	*High*
Projected 1995 employment	72,000	76,000	79,000
Percent change, 1984-95	−1.5	3.7	8.3

Employment growth ..... Slower than average

Annual separation rate (percent) 15.7

SUPPLY PROFILE

Usual entry and training requirements. Skills acquired through previous work experience or vocational education are generally required. Although some mechanics are hired from outside the company, preference usually is given to company employees in other jobs. Physical and written examinations often are mandatory, and applicants should possess manual dexterity, physical stamina, and the ability to distinguish colors. A valid driver's license and a good driving record also may be required. Continuous training may be needed to learn about new types of equipment.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Communications electronics	4,755

Characteristics of entrants. The majority of all entrants transfer from another occupation, such as telephone installer-repairer or line installer-repairer. The remainder have not been working—most have been in school or between jobs. Almost half of all entrants are between 25 and 34 years of age.

Computer service technicians

EMPLOYMENT PROFILE

Total employment, 1984 50,000

Selected characteristics of workers, 1984:	
Percent female	9.4
Percent black	4.7
Age distribution (percent):	
16-24 years	15.2
25-54 years	80.6
55 and older	4.2
Percent employed part time, total	7.8

Percent employed part time, voluntary 1.5

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Machinery, equipment, and supplies wholesalers	60.9
Office, computing, and accounting machine manufacturing	17.1
Computer and data processing services	8.6

	Low	*Moderate*	*High*
Projected 1995 employment	74,000	78,000	81,000
Percent change, 1984-95	48.8	56.2	62.6

Employment growth ..... Much faster than average

Annual separation rate (percent) 11.5

SUPPLY PROFILE

Usual entry and training requirements. Most employers require applicants to have completed 1 to 2 years of postsecondary training in basic electronics or electrical engineering or to have comparable experience. Basic electronics training offered by the Armed Forces also is considered to be excellent training. Regardless of background, technicians continue to participate in employer-sponsored training programs in order to stay abreast of new developments in equipment and maintenance procedures.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Computer electronics and electrical and electronic technologies 24,925

Private noncollegiate postsecondary, 1981:
- Electronic technology 7,533

Armed Forces enlisted strength, 1985:
- ADP computers 9,888

Associate degrees and other awards below baccalaureate, 1983:
- Computer electronics and electrical and electronic technologies 31,833

Characteristics of entrants. About half of all entrants transfer from a related occupation such as office machine repairer, television service technician, or electrical or electronics technician. The remainder have not been working—most have been in a training program, the Armed Forces, or between jobs.

Diesel mechanics

EMPLOYMENT PROFILE

Total employment, 1984 211,000

Selected characteristics of workers, 1984:

Percent female	0.6
Percent black	5.7
Age distribution (percent):	
16-24 years	15.4
25-54 years	74.9
55 and older	9.7
Percent employed part time, total	3.5
Percent employed part time, voluntary	2.4

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Trucking, local and long distance	23.3
Machinery, equipment, and supplies wholesalers	18.5
Automobile repair shops	7.1
Automobile rentals and leasing, without drivers	5.4
Motor vehicles and auto parts and supplies wholesalers	5.2
Government	5.1

	Low	*Moderate*	*High*
Projected 1995 employment	246,000	259,000	270,000
Percent change, 1984-95	16.9	22.8	28.1

Employment growth ..... Faster than average

Annual separation rate (percent) 14.4

SUPPLY PROFILE

Usual entry and training requirements. Most employers seek people with mechanical aptitude and knowledge of basic diesel technology. Although skills are generally acquired through work experience, many employers prefer applicants who have completed a vocational training program or formal apprenticeship. Skills may also be obtained in the Armed Forces or by helping friends or relatives. In addition, a driver's license is required.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Diesel engine mechanics 7,556

Private noncollegiate postsecondary, 1981:
- Diesel mechanic 9,700

Associate degrees and other awards below baccalaureate, 1983:
- Diesel engine mechanics 2,819

Characteristics of entrants. Most entrants are high school graduates. Although many have completed some postsecondary education, few are college graduates. The majority of entrants have not been working. The remainder transfer from another occupation or enter from the Armed Forces where they developed the required skills. Most entrants are 25 years of age or older, reflecting the importance of work experience.

Electronic home entertainment equipment repairers

EMPLOYMENT PROFILE

Total employment, 1984 52,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Radio, television, and music stores	47.9
Electrical repair shops	30.5
Household appliance stores	6.9

	Low	*Moderate*	*High*
Projected 1995 employment	56,000	59,000	62,000
Percent change, 1984-95	6.9	13.2	18.9

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Training in electronics is required for entry level jobs. Formal training is available from postsecondary vocational schools, community colleges, the Armed Forces, or through on-the-job training in a related occupation. A few electronic home entertainment equipment repairers enter through formal apprenticeship programs. Because repairers must keep abreast of changes in technology, they often participate in training seminars and study manufacturers' and technical publications throughout their career.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Electrical and electronic technologies and electrical and electronic equipment repair	55,606
Private noncollegiate postsecondary, 1981:	
Radio and TV repair	1,707
Armed Forces enlisted strength, 1985:	
Radio/radar repair	81,806
Associate degrees and other awards below baccalaureate, 1983:	
Electrical and electronic technologies and electrical and electronic equipment repair	36,165

Farm equipment mechanics

EMPLOYMENT PROFILE

Total employment, 1984 18,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Machinery, equipment, and supplies wholesalers	49.4
Agricultural production, crops	24.8
Agricultural production, livestock	6.3

	Low	*Moderate*	*High*
Projected 1995 employment	19,000	20,000	20,000
Percent change, 1984-95	5.3	9.4	12.7

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Employers seek people with mechanical aptitude and experience in basic farm equipment repair. In addition, related work experience in diesel or gasoline engine repair, welding, and hydraulic and electrical systems is preferred. Formal training in agricultural mechanics from a vocational school or community or junior college is a good substitute for experience.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Agricultural mechanics	23,413
Associate degrees and other awards below baccalaureate, 1983:	
Agricultural mechanics	718

Characteristics of entrants. Many entrants transfer from another occupation where they have developed the necessary skills. Others are recent graduates of a training program in agricultural mechanics.

General maintenance mechanics

EMPLOYMENT PROFILE

Total employment, 1984 878,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Durable goods manufacturing	16.0
Nondurable goods manufacturing	14.3
Wholesale and retail trade	14.9
Educational services	9.3
Real estate operators and lessors	7.6
Local government	6.0
Health services	5.1

	Low	*Moderate*	*High*
Projected 1995 employment	970,000	1,015,000	1,057,000
Percent change, 1984-95	10.5	15.6	20.4

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. General maintenance mechanics usually learn their skills on the job by working as a helper to skilled maintenance workers. Many employers prefer high school graduates. Mechanical aptitude and manual dexterity are important.

Heating, air-conditioning, and refrigeration mechanics

EMPLOYMENT PROFILE

Total employment, 1984 173,000

Selected characteristics of workers, 1984:

Percent female	1.3
Percent black	6.7
Age distribution (percent):	
16-24 years	17.8
25-54 years	72.1
55 and older	10.1
Percent employed part time, total	4.8
Percent employed part time, voluntary	2.5

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Plumbing, heating, and air-conditioning contractors	51.2
Fuel and ice retailers	8.0
Government	7.3
Electrical repair shops	6.7

	Low	*Moderate*	*High*
Projected 1995 employment	194,000	203,000	210,000
Percent change, 1984-95	11.6	16.7	21.1

Employment growth ..... Average

Annual separation rate (percent) 8.8

SUPPLY PROFILE

Usual entry and training requirements. Most persons learn this trade as a helper, working with experienced air-conditioning, heating, and refrigeration mechanics. Some develop their skills in a formal apprenticeship program. Employers generally seek high school graduates with mechanical aptitude who have had courses in shop math, mechanical drawing, electricity, and blueprint reading. Some employers prefer graduates of programs in air-conditioning, heating, and refrigeration offered by postsecondary vocational schools and community and junior colleges. Because of the increased use of microelectronic technology, a basic understanding of electronics is becoming very important. To keep up with changes in technology, mechanics may be required to participate in company-sponsored training programs throughout their career.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Heating, air-conditioning, and refrigeration mechanics	15,235
Private noncollegiate postsecondary, 1981:	
Air-conditioning installation and repair and refrigeration engineering	11,680

Characteristics of entrants. The majority of job entrants transfer from another occupation—primarily persons who have been working as a helper. The remaining entrants have not been working—many are experienced mechanics who have been laid off or between jobs, while others are recent graduates of an apprenticeship program.

Home appliance and power tool repairers

EMPLOYMENT PROFILE

Total employment, 1984	83,000
Selected characteristics of workers, 1984:	
Percent female	2.4
Percent black	1.3
Age distribution (percent):	
16-24 years	11.0
25-54 years	73.9
55 and older	15.1
Percent employed part time, total	15.1
Percent employed part time, voluntary	7.6

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Department stores	30.0
Household appliance stores	15.1
Gas production and distribution	10.0
Fuel and ice dealers	9.7
Electrical repair shops	8.4
Radio, television, and music stores	6.5

	Low	*Moderate*	*High*
Projected 1995 employment	87,000	92,000	97,000
Percent change, 1984-95	5.0	11.0	16.3

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. These workers learn their trade on the job. Employers prefer high school graduates with mechanical aptitude and knowledge of, or work experience in, basic electricity and electronics. Some persons prepare for this occupation by taking postsecondary training courses in appliance repair and electronics, and a few complete a formal apprenticeship program.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Major appliance repair and small appliance repair	2,928
Private noncollegiate postsecondary, 1981:	
Appliance repair	905

Characteristics of entrants. Many entrants transfer from another occupation—many have worked in a related repairer occupation that requires knowledge of basic electricity and electronics. The remainder have not been working—most have been between jobs or in school. Most entrants have a high school diploma, and have some postsecondary training.

Industrial machinery repairers

EMPLOYMENT PROFILE

Total employment, 1984	430,000
Selected characteristics of workers, 1984:	
Percent female	2.7
Percent black	8.0
Age distribution (percent):	
16-24 years	10.3
25-54 years	74.9
55 and older	14.8
Percent employed part time, total	2.3
Percent employed part time, voluntary	1.4

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Government	11.2
Food and kindred products manufacturing	7.9
Transportation, communications, and utilities	7.7
Textile product manufacturing	7.0
Services	6.7
Chemical and allied product manufacturing	5.1
Primary metal manufacturing	5.0

	Low	*Moderate*	*High*
Projected 1995 employment	443,000	464,000	483,000
Percent change, 1984-95	3.0	7.9	12.5

Employment growth ..... Slower than average

Annual separation rate (percent) 13.3

SUPPLY PROFILE

Usual entry and training requirements. Skills acquired through previous work experience generally are required. Most industrial machinery repairers learn the trade informally by working as helpers to experienced repairers. Some learn through formal apprenticeship or high school and postsecondary vocational programs. Graduation from high school is preferred, but not always required. Mechanical aptitude and manual dexterity are important. In order to keep up with changing technology, industrial machinery repairers must continually upgrade their skills by participating in employer-sponsored training programs.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Industrial equipment maintenance and repair 4,636

Private noncollegiate postsecondary, 1981:
- Industrial technology 447

Associate degrees and other awards below baccalaureate, 1983:
- Industrial equipment maintenance and repair 1,225

Characteristics of entrants. The majority of entrants have not been working—primarily persons on temporary layoff or between jobs. The remaining entrants transfer from a helper or other blue-collar job where they developed the required skills. Relatively few entrants have completed training beyond high school. Entrants tend to be older than entrants to other occupations, reflecting the emphasis on work experience.

Line installers and cable splicers

EMPLOYMENT PROFILE

Total employment, 1984 204,000

Selected characteristics of workers, 1984:

Percent female	2.9
Percent black	5.9
Age distribution (percent):	
16-24 years	7.0
25-54 years	90.9
55 and older	2.1
Percent employed part time, total	7

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Telephone communication	30.5
Electric services	26.9
Miscellaneous communication services (includes cable television services, missile tracking stations, and stock ticker services)	11.7
Combination electric and gas, and other utilities	8.1
Heavy construction, except highway and street	7.1
Local government	6.9
Electrical contractors	5.6

	Low	*Moderate*	*High*
Projected 1995 employment	217,000	228,000	237,000
Percent change, 1984-95	6.2	11.6	16.3

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Line installers and cable splicers learn the craft by assisting experienced workers or through formal company training programs. Most employers prefer to hire high school graduates, and many test applicants for basic verbal, arithmetic, and abstract reasoning skills. In addition, applicants may be tested for physical ability and mechanical aptitude. Applicants should have physical stamina, the ability to distinguish colors, and not be afraid of heights. Because of changing technology and the opportunity for advancement, many workers continue their training throughout their career.

Characteristics of entrants. The majority of entrants have not been working—most were unemployed. The remainder have been working in another occupation. Most entrants have a high school education, and some have attended college.

Millwrights

EMPLOYMENT PROFILE

Total employment, 1984 84,000

Selected characteristics of workers, 1984:

Percent female	2.1
Percent black	6.9
Age distribution (percent):	
16-24 years	5.8
25-54 years	80.8
55 and older	13.4
Percent employed part time, total	1.9
Percent employed part time, voluntary	1.2

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Blast furnaces and basic steel products	15.1
Motor vehicle and equipment manufacturing	11.5
Miscellaneous special trade contractors (includes structural steel erection and installation or erection of building equipment)	8.7
Paper and allied products manufacturing	7.9
Nonresidential building construction	7.1
Fabricated metal product manufacturing	6.9
Chemical and allied product manufacturing	5.4

	Low	*Moderate*	*High*
Projected 1995 employment	85,000	89,000	95,000
Percent change, 1984-95	1.0	6.6	13.3

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Millwrights learn their trade on the job, either by working as a helper to an experienced millwright or through a formal apprenticeship program. Most employers seek high school graduates who are agile and able to perform heavy work.

Characteristics of entrants. Most entrants transfer from another occupation—primarily millwright helper or another blue-collar job—or are experienced millwrights returning to a job from which they have been temporarily laid off. Others were full-time students. Few have completed any training beyond high school.

Mobile heavy equipment mechanics

EMPLOYMENT PROFILE

Total employment, 1984 77,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Machinery, equipment, and supplies wholesalers	29.5
Federal Government	15.8
Mining	8.1
Highway and street construction	5.6
Heavy construction, except highway and street	5.2

	Low	Moderate	High
Projected 1995 employment ..	86,000	89,000	92,000
Percent change, 1984-95	11.6	15.4	18.9

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Employers prefer graduates of formal training programs in diesel or heavy equipment mechanics that are offered at vocational schools and junior and community colleges. Skills acquired through home study coupled with work experience in related, lesser skilled occupations may be an acceptable substitute for formal training. In either case, knowledge of the repair of diesel engines, drive trains, hydraulics, and electrical systems is required. To learn a specific type of equipment or a particular component or to update their knowledge of new technologies, mobile heavy equipment mechanics may participate in manufacturer-sponsored training programs. Mechanical aptitude is important.

Training completions:

Associate degrees and other awards below baccalaureate, 1983:
- Heavy equipment maintenance and repair and diesel engine mechanics 3,188

Musical instrument repairers and tuners

EMPLOYMENT PROFILE

Total employment, 1984 9,200

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Radio, television, and music stores	80.2
Miscellaneous repair services (includes piano, organ, and other musical instrument repair)	11.9
Musical instrument manufacturing	5.2

	Low	Moderate	High
Projected 1995 employment ..	9,800	10,000	10,000
Percent change, 1984-95	6.3	9.7	12.7

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Most musical instrument repairers learn their trade on the job, working under the supervision of experienced repairers for 2 to 5 years. Most employers prefer high school graduates. Persons who have some familiarity with the trade may find it easier to get an entry level job. A relatively small number of repairers develop their skills by taking courses offered by postsecondary vocational schools. People interested in a career as a musical instrument repairer should have good hearing, mechanical aptitude, stamina, and manual dexterity.

Office machine and cash register servicers

EMPLOYMENT PROFILE

Total employment, 1984 53,000

Selected characteristics of workers, 1984:
- Percent female 3.6
- Percent black 13.4
- Age distribution (percent):
  - 16-24 years 19.6
  - 25-54 years 76.2
  - 55 and older 4.2
- Percent employed part time, total 5.0
- Percent employed part time, voluntary 4.7

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Machinery, equipment, and supplies wholesalers ...	83.8
Retail trade	5.4

	Low	Moderate	High
Projected 1995 employment ..	65,000	68,000	71,000
Percent change, 1984-95	23.9	30.0	35.4

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Employers seek persons with a basic knowledge of electricity and electronics, mechanical aptitude, good eyesight, and the ability to distinguish colors. Many employers require at least a year of postsecondary training in basic electricity or electronics. A well-groomed appearance and a pleasant, cooperative manner are important, as well as an ability to communicate effectively. A few persons develop their skills through a formal apprenticeship program, and others learn their trade in the Armed Forces. On the job, repairers continue to develop their skills by assisting more experienced workers and by participating in manufacturer-sponsored training programs.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Business machine repair 477

Private noncollegiate postsecondary, 1981:
- Business machine maintenance 335

Characteristics of entrants. Many entrants transfer from another occupation—many have worked in a related occupation where they serviced mechanical and electronic equipment such as home appliances, automotive electrical systems, and radio and television equipment. The remaining job openings are filled by persons who have not been working—some were between jobs, some were full-time students, and others were in the Armed Forces.

Telephone installers and repairers

EMPLOYMENT PROFILE

Total employment, 1984 111,000

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Selected characteristics of workers, 1984:

Percent female	8.2
Percent black	6.8
Age distribution (percent):	
16-24 years	5.7
25-54 years	87.0
55 and older	7.3
Percent employed part time, total	1.2
Percent employed part time, voluntary	0.8

Unemployment rate ..... Lower than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Telephone communication	92.2
Miscellaneous communication services (includes cablevision services; telecommunications except telephone, telegraph, radio, videophone, and TV; and related services)	6.1

	Low	*Moderate*	*High*
Projected 1995 employment	87,000	92,000	96,000
Percent change, 1984-95	-21.6	-17.4	-13.8

Employment growth ..... Decline

Annual separation rate (percent) ..... [1]7.4

[1]The number of separations may be artificially high. Employment in the occupation declined between 1983 and 1984; some workers who left were not replaced.

SUPPLY PROFILE

Usual entry and training requirements. Applicants usually are selected from the ranks of other telephone company workers—such as line installer or cable splicer. Employers require good eyesight, the ability to distinguish colors, good health, and mechanical aptitude. Many prefer applicants with a high school diploma and a basic knowledge of electricity and electronics. This can be developed by on-the-job training, through a formal training program, or in the Armed Forces. Telephone craft workers continue to update their skills to qualify for more responsible positions and keep up with technological advances.

Vending machine servicers and repairers

EMPLOYMENT PROFILE

Total employment, 1984 33,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Nonstore retailers	49.4
Miscellaneous amusement and recreation services (includes amusement parks, coin-operated amusement devices, and related services)	23.9
Beverage manufacturing	15.8
Miscellaneous business services (includes equipment rental and leasing services, photofinishing laboratories, and related services)	6.2

	Low	*Moderate*	*High*
Projected 1995 employment	36,000	38,000	40,000
Percent change, 1984-95	8.9	14.9	20.2

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Vending machine repairers generally are hired as shop helpers or route drivers, where they learn informally on the job, working under the supervision of experienced repairers. Some employers require a high school diploma. Training in basic electronics also is becoming increasingly important. Employers may require applicants to demonstrate mechanical ability, either through their work experience or by scoring well on mechanical aptitude tests. A commercial driver's license and a good driving record are essential for most vending machine repairer jobs. To learn about new machines and technology, repairers continue to attend manufacturer-sponsored training programs or take courses at technical schools.

Training completions:

Public vocational secondary and postsecondary, 1983:

Vending and recreational machine repair	499

Construction and Extractive Occupations

Bricklayers and stonemasons

EMPLOYMENT PROFILE

Total employment, 1984 140,000

Selected characteristics of workers, 1984:

Percent female	0.3
Percent black	15.0
Age distribution (percent):	
16-24 years	17.0
25-54 years	68.5
55 and older	14.5
Percent employed part time, total	10.8
Percent employed part time, voluntary	3.8

Unemployment rate ..... Much higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Masonry, stonework, tile setting, and plastering contractors	65.5
Nonresidential building construction	10.6
Residential building construction	9.2

	Low	*Moderate*	*High*
Projected 1995 employment	148,000	155,000	161,000
Percent change, 1984-95	5.4	10.6	14.5

Employment growth ..... Average

Annual separation rate (percent) 13.9

SUPPLY PROFILE

Usual entry and training requirements. Bricklayers and stonemasons learn their craft on the job, either informally by helping experienced workers or through a formal apprenticeship program. Employers

and apprenticeship committees prefer high school graduates who are in good physical condition. Applicants for apprenticeship must be at least 17 years old.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Brick masonry, stonemasonry, and tile setting, general and brick, block, and stone masonry	8,183
Private noncollegiate postsecondary, 1981:	
Masonry	1,248

Characteristics of entrants. Many workers experience periodic layoffs when construction projects end and during declines in construction activity. Consequently, most entrants are experienced workers being recalled from layoff, between jobs, or persons who transfer from a job in another occupation they have taken on a temporary basis. Others are recent graduates of an apprenticeship or other training program.

Carpenters

EMPLOYMENT PROFILE

Total employment, 1984	944,000
Selected characteristics of workers, 1984:	
Percent female	1.3
Percent black	5.5
Age distribution (percent):	
16-24 years	20.9
25-54 years	67.9
55 and older	11.2
Percent employed part time, total	9.0
Percent employed part time, voluntary	4.1
Unemployment rate	Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Residential building construction	32.1
Nonresidential building construction	18.8
Carpentering and flooring contractors	7.9
Durable goods manufacturing	7.8

	Low	*Moderate*	*High*
Projected 1995 employment	998,000	1,046,000	1,085,000
Percent change, 1984-95	5.7	10.7	14.9

Employment growth	Average
Annual separation rate (percent)	18.8

SUPPLY PROFILE

Usual entry and training requirements. Most carpenters learn their trade informally by working under the supervision of experienced workers. Some acquire their skills by participating in a formal apprenticeship program or by assisting friends and relatives. Although there are no formal entry requirements, employers prefer high school graduates who are in good physical condition and who have manual dexterity, good eye-hand coordination, and good balance.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Carpentry	27,377
Private noncollegiate postsecondary, 1981:	
Carpentry, construction	4,542

Characteristics of entrants. Many carpenters face periodic layoffs because of the short-term nature of many construction projects and the cyclical nature of the industry. Consequently, the majority of entrants are experienced carpenters returning to the occupation after a period of unemployment. The remainder transfer from another occupation, frequently another construction occupation. Few entrants have any training beyond high school.

Carpet installers

EMPLOYMENT PROFILE

Total employment, 1984	71,000
Selected characteristics of workers, 1984:	
Percent female	1.4
Percent black	7.3
Age distribution (percent):	
16-24 years	23.1
25-54 years	72.4
55 and older	4.5
Percent employed part time, total	13.1
Percent employed part time, voluntary	5.5

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Carpentering and flooring contractors	51.9
Furniture and home furnishings, except appliances	38.6

	Low	*Moderate*	*High*
Projected 1995 employment	78,000	82,000	86,000
Percent change, 1984-95	10.6	15.9	20.8

Employment growth	Average

SUPPLY PROFILE

Usual entry and training requirements. Almost all carpet installers learn the trade by working as a helper to experienced installers. A few learn through a formal apprenticeship. Employers prefer high school graduates who have manual dexterity and are mechanically inclined. Because installers often are required to drive company vehicles, employers prefer individuals who are licensed to drive and who have a good driving record.

Characteristics of entrants. Many entrants transfer from another occupation—primarily a job as an installer's helper. Others have been between jobs or are recent graduates of an apprenticeship program. Although virtually all entrants have a high school diploma, few have any postsecondary training.

Concrete masons and terrazzo workers

EMPLOYMENT PROFILE

Total employment, 1984	106,000

Selected characteristics of workers, 1984:

Percent female	0.8
Percent black	29.3
Age distribution (percent):	
16-24 years	19.2
25-54 years	69.7
55 and older	11.1
Percent employed part time, total	7.6
Percent employed part time, voluntary	1.5

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Concrete contractors	31.4
Nonresidential building construction	15.6
Residential building construction	11.0
Masonry, stonework, tile setting, and plastering	9.2
Highway and street construction	7.5
Miscellaneous special trade contractors (includes excavating and foundation contractors, and related contracting services)	7.5
Heavy construction, except highway and street	7.0

	Low	*Moderate*	*High*
Projected 1995 employment	118,000	123,000	127,000
Percent change, 1984-95	11.5	16.2	19.7

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Concrete masons and terrazzo workers learn their trade on the job, either informally by helping experienced workers or in a formal apprenticeship program. Employers and apprenticeship committees prefer high school graduates who are at least 18 years old and in good physical condition.

Characteristics of entrants. Workers may experience periodic layoffs when construction projects end and when the level of nonresidential building falls. Consequently, the majority of entrants are older, experienced workers being recalled from layoff or who have been between jobs. Some are recent graduates of an apprenticeship program. The remainder transfer from another occupation—in many cases, a job taken on a temporary basis.

Drywall workers and lathers

EMPLOYMENT PROFILE

Total employment, 1984 106,000

Selected characteristics of workers, 1984:

Percent female	1.8
Percent black	9.4
Age distribution (percent):	
16-24 years	31.5
25-54 years	64.7
55 and older	3.8
Percent employed part time, total	9.4
Percent employed part time, voluntary	3.9

Unemployment rate ..... Much higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Masonry, stonework, tile setting, and plastering contractors	83.8
Painting, paperhanging, and decorating contractors	6.3

	Low	*Moderate*	*High*
Projected 1995 employment	112,000	117,000	121,000
Percent change, 1984-95	6.0	10.6	14.3

Employment growth ..... Average

Annual separation rate (percent) 12.1

SUPPLY PROFILE

Usual entry and training requirements. Most drywall workers and lathers start as helpers and learn their craft on the job. Some learn through a formal apprenticeship program or by assisting friends or relatives. Employer prefer high school graduates who are in good physical condition, but frequently hire applicants with less education.

Characteristics of entrants. Workers may experience periodic layoffs when projects end and during declines in construction activity. Consequently, many entrants are experienced workers who are being recalled from layoff or who have been between jobs. Others are entering their first job or transfer from another occupation they have entered on a temporary basis. Most entrants have a high school diploma or less education.

Electricians

EMPLOYMENT PROFILE

Total employment, 1984 545,000

Selected characteristics of workers, 1984:

Percent female	1.2
Percent black	6.1
Age distribution (percent):	
16-24 years	13.9
25-54 years	74.8
55 and older	11.3
Percent employed part time, total	3.5
Percent employed part time, voluntary	1.5

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Electrical contractors	47.1
Durable goods manufacturing	16.1
Services	7.6
Government	7.4
Nondurable goods manufacturing	7.1
Transportation, communications, and utilities	5.3

	Low	*Moderate*	*High*
Projected 1995 employment	606,000	633,000	657,000
Percent change, 1984-95	11.2	16.2	20.5

Employment growth ..... Average

Annual separation rate (percent) 12.6

SUPPLY PROFILE

Usual entry and training requirements. Electricians learn their craft on the job, either informally by working as an electrician's helper or through a formal apprenticeship program. Employers and apprenticeship committees prefer graduates of vocational programs. Applicants for apprentice positions generally need to be at least 18 years old and have a high school diploma; applicants for all jobs must be in good physical condition and have manual dexterity and good color vision. Most local governments require a license that is obtained by passing an exam that tests knowledge of the craft and local electrical codes.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Electrician	12,616
Private noncollegiate postsecondary, 1981:	
Electricity, construction	2,229

Characteristics of entrants. Many construction electricians face periodic layoffs because of the cyclical nature of the construction industry and the short-term nature of most construction projects. Maintenance electricians working in automobile, steel, and other industries that are sensitive to the business cycle also may be laid off from time to time. Consequently, most entrants are experienced electricians who have been unemployed, between jobs, or working temporarily in another occupation. Other entrants have been working as an electrician's helper or are recent graduates of an apprenticeship program.

Glaziers

EMPLOYMENT PROFILE

Total employment, 1984 37,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Miscellaneous special trade contractors (includes glass and glazing contractors and glazing of concrete surfaces contractors)	45.4
Paint, glass, and wallpaper stores	31.5
Lumber and other construction materials wholesalers	10.4

	Low	*Moderate*	*High*
Projected 1995 employment	43,000	45,000	46,000
Percent change, 1984-95	15.2	20.8	25.3

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Glaziers learn their trade on the job, a few formally through an apprenticeship program but most informally by helping experienced workers. Applicants must be in good physical condition; those seeking an apprenticeship position must be at least 17 years of age.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Glazing	153

Characteristics of entrants. Glaziers may experience periods of unemployment between construction projects and during downturns in construction activity. Consequently, many entrants are experienced workers who have been laid off or between jobs, or who transfer from another occupation entered on a temporary basis. Others have been working as a glazier's helper or are recent graduates of an apprenticeship program.

Insulation workers

EMPLOYMENT PROFILE

Total employment, 1984 52,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Masonry, stonework, tile setting, and plastering contractors	57.5
Miscellaneous special trade contractors	13.7

	Low	*Moderate*	*High*
Projected 1995 employment	57,000	59,000	61,000
Percent change, 1984-95	9.0	13.6	17.2

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Insulation workers learn their craft on the job, either informally by working as helpers to experienced workers or through a formal apprenticeship program. Insulation contractors prefer high school graduates who are in good physical condition. High school courses in blueprint reading, shop math, sheet-metal layout, and general construction are helpful. Applicants for an apprenticeship position must have a high school diploma or its equivalent, and be at least 18 years old.

Characteristics of entrants. Insulation workers may experience periodic layoffs when construction projects end and during declines in construction activity. Consequently, the majority of entrants are experienced workers returning to the occupation after a period of unemployment or work in another occupation, usually taken on a temporary basis. The remaining entrants have been working as a helper or are recent graduates of a formal apprenticeship program. Very few entrants have any formal education beyond high school.

Painters and paperhangers

EMPLOYMENT PROFILE

Total employment, 1984 378,000

Selected characteristics of workers, 1984:	
Percent female	6.8
Percent black	8.3
Age distribution (percent):	
16-24 years	24.5
25-54 years	63.8
55 and older	11.7
Percent employed part time, total	19.4
Percent employed part time, voluntary	9.1

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Painting, paperhanging, and decorating contractors	46.1
Services	14.4
Government	8.6
General contractors and operative builders	7.1
Durable goods manufacturing	6.6
Real estate	5.8

	Low	Moderate	High
Projected 1995 employment	378,000	395,000	409,000
Percent change, 1984-95	0.0	4.5	8.3

Employment growth ..... Slower than average

Annual separation rate (percent) 22.8

SUPPLY PROFILE

Usual entry and training requirements. Most people learn the trade informally by helping experienced workers. Some develop their skills in a formal apprenticeship program. Applicants for an apprenticeship or helper job should be in good physical condition, have manual dexterity, be at least 16 years old, and have a good color sense.

Training completions:

Public vocational secondary and postsecondary, 1983:
Painting and decorating 767
Private noncollegiate postsecondary, 1981:
Painting and decorating 476

Characteristics of entrants. Many painters and paperhangers experience periods of unemployment because construction projects often are short term and construction activity is cyclical. Consequently, the majority of entrants are experienced painters and paperhangers who have been unemployed, between jobs, or working temporarily in another occupation. Others have been working as a helper or are recent graduates of an apprenticeship program. Many entrants work part time.

Plasterers

EMPLOYMENT PROFILE

Total employment, 1984 21,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Masonry, stonework, tile setting, and plastering contractors	88.0

	Low	Moderate	High
Projected 1995 employment	21,000	22,000	22,000
Percent change, 1984-95	0.3	3.9	6.6

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Plasterers learn their craft on the job, either informally by working as helpers to expeienced workers or through a formal apprenticeship program. Applicants for an apprenticeship or helper job generally must be at least 17 years old, be in good physical condition, and have manual dexterity. Employers prefer but do not require that applicants have a high school diploma.

Characteristics of entrants. Workers may experience periodic layoffs when construction projects end and during declines in construction activity. Consequently, about half of all entrants are experienced workers returning to the occupation after a period of unemployment. The remainder transfer from another occupation they have entered on a temporary basis. Very few entrants have any formal education beyond high school.

Plumbers and pipefitters

EMPLOYMENT PROFILE

Total employment, 1984 395,000

Selected characteristics of workers, 1984:
Percent female 1.1
Percent black 6.4
Age distribution (percent):
16-24 years 16.1
25-54 years 71.5
55 and older 12.4
Percent employed part time, total 5.6
Percent employed part time, voluntary 2.5

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Plumbing, heating, and air-conditioning contractors	51.7
Durable goods manufacturing	11.1
Nondurable goods manufacturing	6.2
Heavy construction, except highway and street	6.1
Federal Government	5.5

	Low	Moderate	High
Projected 1995 employment	436,000	455,000	472,000
Percent change, 1984-95	10.6	15.4	19.5

Employment growth ..... Average

Annual separation rate (percent) 12.8

SUPPLY PROFILE

Usual entry and training requirements. Plumbers and pipefitters learn their craft on the job, either informally by working for several years as a helper to experienced plumbers and pipefitters or through a formal apprenticeship program. Applicants for an apprentice or helper job generally must be at least 18 years of age and in good physical condition. Employers and apprenticeship committees prefer high school or vocational education graduates. Most local governments require a license that is obtained by passing an examination that tests knowledge of the craft and local plumbing codes.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Plumbing, pipefitting, and steamfitting	6,236
Private noncollegiate postsecondary, 1981:	
Plumbing and pipefitting	2,213

Characteristics of entrants. Plumbers and pipefitters may experience periodic layoffs when construction projects end and when construction activity declines. Consequently, most entrants are experienced workers who have been unemployed, between jobs, or working temporarily in another occupation. Other entrants have been working as a helper or are recent graduates of an apprenticeship program.

Roofers

EMPLOYMENT PROFILE

Total employment, 1984	122,000
Selected characteristics of workers, 1984:	
Percent female	0.7
Percent black	9.1
Age distribution (percent):	
16-24 years	32.0
25-54 years	63.0
55 and older	5.0
Percent employed part time, total	15.3
Percent employed part time, voluntary	5.0
Unemployment rate	Much higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Roofing and sheet-metal contractors	89.3

	Low	*Moderate*	*High*
Projected 1995 employment	132,000	138,000	143,000
Percent change, 1984-95	8.4	13.4	17.5

Employment growth	Average
Annual separation rate (percent)	25.6

SUPPLY PROFILE

Usual entry and training requirements. Most roofers acquire their skills informally by working as a helper to experienced roofers. A few learn through an apprenticeship program. Roofers need to be in good physical condition and should have good balance and agility. Applicants for apprenticeship must be at least 18 years old, and a high school diploma is helpful.

Characteristics of entrants. Because of the seasonal nature of the construction industry and the short duration of most roofing jobs, the majority of entrants have been unemployed, between jobs, or in a temporary job in another occupation. The remaining entrants have been working as a roofer's helper or are recent graduates of an apprenticeship program.

Roustabouts

EMPLOYMENT PROFILE

Total employment, 1984	81,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Oil and gas field services	75.2
Crude petroleum and natural gas	24.3

	Low	*Moderate*	*High*
Projected 1995 employment	77,000	81,000	84,000
Percent change, 1984-95	−4.8	−0.3	3.3

Employment growth	Little change

SUPPLY PROFILE

Usual entry and training requirements. Little or no formal training or work experience is required. However, with more competition for jobs in recent years, an increasing proportion of entrants to this occupation have relevant work experience. Mechanical ability, good physical condition, and good eyesight are required. In addition, many employers prefer those with a high school diploma.

Characteristics of entrants. Roustabouts may experience periodic layoffs due to the cyclical nature of oil and gas exploration and production. Consequently, many entrants are experienced workers who have been unemployed or temporarily working in another occupation.

Sheet-metal workers

EMPLOYMENT PROFILE

Total employment, 1984	100,000
Selected characteristics of workers, 1984:	
Percent female	4.3
Percent black	2.8
Age distribution (percent):	
16-24 years	15.7
25-54 years	71.1
55 and older	13.2
Percent employed part time, total	2.4
Percent employed part time, voluntary	1.6
Unemployment rate	Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Plumbing, heating, and air-conditioning contractors	61.3
Roofing and sheet-metal contractors	24.4

	Low	*Moderate*	*High*
Projected 1995 employment	111,000	116,000	120,000
Percent change, 1984-95	11.1	16.1	19.9

Employment growth	Average
Annual separation rate (percent)	[1]18.3

[1]Separations may be artificially high. Employment in the occupation declined between 1983 and 1984; some workers who left were not replaced.

SUPPLY PROFILE

Usual entry and training requirements. Most sheet-metal workers learn their trade through formal apprenticeship. A few learn informally by working as a helper to experienced workers. Local apprenticeship committees and employers may require a high school or vocational school education. Applicants need to be in good physical condition and have mechanical aptitude.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Sheet metal 2,443

Characteristics of entrants. Workers may experience periodic layoffs when construction projects end and when economic conditions result in a decline in construction activity. Consequently, the majority of entrants are experienced sheet-metal workers who have been unemployed or between jobs, or who are transferring from a temporary job in another occupation. Others are recent graduates of apprenticeship or other training programs.

Structural and reinforcing metal workers

EMPLOYMENT PROFILE

Total employment, 1984 86,000

Selected characteristics of workers, 1984:

Percent female	0.4
Percent black	5.6
Age distribution (percent):	
16-24 years	15.0
25-54 years	71.1
55 and older	13.9
Percent employed part time, total	5.2
Percent employed part time, voluntary	2.1

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Miscellaneous special trade contractors (includes structural steel erection contractors)	45.7
Nonresidential building construction	20.4
Heavy construction, except highway and street	13.3

	Low	*Moderate*	*High*
Projected 1995 employment	98,000	102,000	106,000
Percent change, 1984-95	13.5	18.5	22.3

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Ironworkers learn the trade informally by working as a helper to experienced ironworkers or through formal apprenticeship. Applicants generally must be at least 18 years old and in good physical condition. Agility and balance also are needed. Graduation from high school usually is preferred by employers, and is required by most apprenticeship committees.

Characteristics of entrants. Workers may experience periodic layoffs when construction projects end and during declines in construction activity. Consequently, many entrants are experienced workers returning to the occupation after a period of unemployment. Others transfer from an occupation taken on a temporary basis. Few entrants have any formal education beyond high school.

Tilesetters

EMPLOYMENT PROFILE

Total employment, 1984 25,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Masonry, stonework, tile setting, and plastering contractors	72.6
Carpentering and flooring contractors	14.2

	Low	*Moderate*	*High*
Projected 1995 employment	27,000	28,000	29,000
Percent change, 1984-95	8.7	11.8	14.2

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Tilesetters learn the trade informally by working as a helper to experienced workers or through a formal apprenticeship. Employers and apprenticeship committees usually prefer high school graduates. Good physical condition, manual dexterity, and a good sense of color harmony are important assets.

Characteristics of entrants. Tilesetters may experience periodic layoffs when construction projects end and during declines in construction activity. Consequently, many entrants are experienced workers returning to the occupation after working temporarily in another occupation or after a period of unemployment. Very few have any formal education beyond high school.

Production Occupations

Blue-collar worker supervisors

EMPLOYMENT PROFILE

Total employment, 1984 1,470,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Nondurable goods manufacturing	24.8
Transportation, communications, and utilities	9.4
Machinery manufacturing, except electrical	6.5
Wholesale trade	6.1
Construction	5.8
Electrical and electronic machinery and equipment manufacturing	5.6
Fabricated metal product manufacturing	5.4

	Low	*Moderate*	*High*
Projected 1995 employment	1,481,000	1,555,000	1,622,000
Percent change, 1984-95	0.7	5.8	10.4

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Most blue-collar worker supervisors are promoted from among the workers they supervise. Leadership qualities, knowledge of the work being done, and the ability to get along well with others are key attributes valued by employers. High school graduation often is required, and college or technical school training can be an asset. Once promoted, companies often train employees in recordkeeping and other supervisory tasks.

Characteristics of entrants. This is not usually an entry level job. Most entrants transfer from another occupation—often they are promoted from a job where they operated a machine, worked on an assembly line, or at a construction craft. The remainder have not been working; many have been laid off during a slowdown in construction or production activity. Supervisors in construction are more likely to experience periodic layoffs than other supervisors. Few entrants come directly from school. Most are in their prime working years, between the ages of 25 and 54.

Boilermakers

EMPLOYMENT PROFILE

Total employment, 1984 38,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Plumbing, heating, and air-conditioning contractors	11.2
Miscellaneous special trade contractors (includes installation of machinery and other industrial equipment contractors)	10.6
Heavy construction, except highway and street	10.3
Nondurable goods manufacturing	9.8
Miscellaneous repair shops and related services (includes boiler repair services)	7.8
Federal Government	7.5
Nonresidential building construction	7.3

	Low	Moderate	High
Projected 1995 employment	40,000	41,000	43,000
Percent change, 1984-95	5.6	10.4	14.8

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Boilermakers learn their trade on the job, either informally by working for several years as a helper to experienced workers or through a formal apprenticeship program. Most employers and apprenticeship committees prefer high school graduates with mechanical aptitude who are in good physical condition.

Bookbinding workers

EMPLOYMENT PROFILE

Total employment, 1984 81,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Commercial printing	45.9
Blankbooks and bookbinding	22.6
Books	5.8
Mailing, reproduction and commercial art	5.6

	Low	Moderate	High
Projected 1995 employment	91,000	95,000	99,000
Percent change, 1984-95	13.2	17.4	22.0

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Bookbinding workers learn their trade on the job. Although informal training is sufficient for production line jobs, an apprenticeship is required to become a skilled bookbinder. Apprenticeship applicants should have a high school education and be at least 18 years old. Accuracy, patience, good eyesight, and manual dexterity are needed by all bookbinding workers. Artistic ability and imagination are necessary for bookbinders who repair or assemble valuable books by hand.

Characteristics of entrants. Typical entrants are high school graduates who have not been working. Some are recent graduates of an apprenticeship program. Relatively few transfer from another occupation.

Butchers and meatcutters

EMPLOYMENT PROFILE

Total employment, 1984 222,000

Selected characteristics of workers, 1984:

Percent female	16.8
Percent black	14.4
Age distribution (percent):	
16-24 years	23.6
25-54 years	62.0
55 and older	14.4
Percent employed part time, total	10.4
Percent employed part time, voluntary	6.8

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Grocery stores	51.2
Meat products manufacturing	27.4
Meat and fish markets	8.8
Groceries and related product wholesalers	6.8

	Low	Moderate	High
Projected 1995 employment	203,000	213,000	220,000
Percent change, 1984-95	−8.3	−4.0	−0.5

Employment growth ..... Decline

SUPPLY PROFILE

Usual entry and training requirements. Most butchers and meatcutters acquire their skills informally on the job or through a formal apprenticeship program. A few acquire their skills in high school and postsecondary vocational programs.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Precision food production 952

Compositors and typesetters

EMPLOYMENT PROFILE

Total employment, 1984 94,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Newspapers	39.5
Commercial printing	24.2
Printing trade services	12.0

	Low	*Moderate*	*High*
Projected 1995 employment	104,000	108,000	112,000
Percent change, 1984-95	11.0	14.7	19.3

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Compositors and typesetters learn their trade on the job, either through a formal apprenticeship program, informally by working as a helper to experienced compositors and typesetters, or through high school vocational programs that provide an introduction to the printing industry and familiarity with the computer-assisted equipment coming into widespread use. Applicants must be high school graduates, in good physical condition, and know how to type.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Composition, make-up, and typesetting 182

Dental laboratory technicians

EMPLOYMENT PROFILE

Total employment, 1984 51,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Medical and dental laboratories	77.0
Offices of dentists	19.0

	Low	*Moderate*	*High*
Projected 1995 employment	57,000	61,000	64,000
Percent change, 1984-95	11.4	19.4	25.3

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Dental laboratory technicians generally learn their craft on the job, either by helping experienced technicians or through a formal apprenticeship program. Many employers hire only high school graduates, and high school courses in art, metal shop, and science are important. Applicants who have taken formal training in community and junior colleges, postsecondary vocational schools, or the Armed Forces are preferred. Many employers encourage technicians to take courses throughout their career in order to keep up with advances in technology.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Dental laboratory technology 1,182

Private noncollegiate postsecondary, 1981:
- Dental laboratory technology 740

Associate degrees and other awards below baccalaureate, 1983:
- Dental laboratory technology 847

Jewelers

EMPLOYMENT PROFILE

Total employment, 1984 32,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Miscellaneous shopping goods stores (includes jewelry, camera, and related stores)	49.6
Jewelry, silverware, and plated ware manufacturing	28.7
Watch, clock, and jewelry repair	9.8

	Low	*Moderate*	*High*
Projected 1995 employment	33,000	35,000	37,000
Percent change, 1984-95	1.6	8.3	14.5

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Although there are no formal educational requirements, employers prefer high school graduates. Vocational school programs are the major source of training for those who want jobs in jewelry stores or repair shops. Informal on-the-job training is necessary for all jewelers regardless of educational background. Applicants need finger and hand dexterity, good eye-hand coordination, patience, and concentration. Artistic ability is an important asset.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Jewelry design, fabrication, and repair 589

Lithographic and photoengraving workers

EMPLOYMENT PROFILE

Total employment, 1984 75,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Commercial printing	52.1
Printing trade services	13.1
Newspapers	12.0

	Low	*Moderate*	*High*
Projected 1995 employment	85,000	88,000	91,000
Percent change, 1984-95	13.7	17.9	22.3

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Most lithographic and photoengraving workers learn their trade informally on the job by

helping experienced workers. Some learn through a formal apprenticeship, although few opportunities have been available in recent years. Applicants usually must be high school graduates, at least 18 years old, in good physical condition, and possess good eyesight and artistic ability.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Lithography, photography, and platemaking 180

Machinists

EMPLOYMENT PROFILE

Total employment, 1984 354,000

Selected characteristics of workers, 1984:
- Percent female 4.9
- Percent black 6.5
- Age distribution (percent):
  - 16-24 years 13.8
  - 25-54 years 72.3
  - 55 and older 13.9
- Percent employed part time, total 2.1
- Percent employed part time, voluntary 1.6

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Machinery manufacturing, except electrical	37.5
Fabricated metal product manufacturing	10.0
Transportation equipment manufacturing	9.5
Nondurable goods manufacturing	9.0
Services	7.1
Electrical and electronic machinery and equipment manufacturing	6.8

	Low	*Moderate*	*High*
Projected 1995 employment	372,000	391,000	407,000
Percent change, 1984-95	5.0	10.5	14.9

Employment growth ..... Slower than average

Annual separation rate (percent) 14.6

SUPPLY PROFILE

Usual entry and training requirements. Machinists develop their skills informally on the job by working as a helper to experienced machinists and through a formal apprenticeship program. Many employers prefer secondary or postsecondary vocational school graduates. Applicants for both apprenticeship and helper positions should have mechanical aptitude, the ability to work independently, and be in good physical condition. Experience working with machine tools is very important.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Machine tool operation/machine shop 27,303

Private noncollegiate postsecondary, 1981:
- Machine shop occupations 1,337

Characteristics of entrants. The majority of entrants transfer from another occupation, primarily machine tool operator, job and die setter, or helper. Most of the remaining entrants are experienced machinists being recalled from layoffs caused by economic conditions. Others are recent graduates of an apprenticeship program.

Metalworking and plastic-working machine operators

EMPLOYMENT PROFILE

Total employment, 1984 953,000

Selected characteristics of workers, 1984:
- Percent female 17.4
- Percent black 11.0
- Age distribution (percent):
  - 16-24 years 16.0
  - 25-54 years 71.3
  - 55 and older 12.7
- Percent employed part time, total 2.5
- Percent employed part time, voluntary 1.6

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Machinery manufacturing, except electrical	26.3
Fabricated metal product manufacturing	26.2
Transportation equipment manufacturing	15.9
Electrical and electronic machinery and equipment manufacturing	8.4

	Low	*Moderate*	*High*
Projected 1995 employment	910,000	956,000	998,000
Percent change, 1984-95	−4.5	0.3	4.7

Employment growth ..... Little change

SUPPLY PROFILE

Usual entry and training requirements. Although there are no formal education requirements for this semiskilled occupation, completion of a postsecondary vocational program can be helpful in finding a job. Most machine-tool operators learn their skills on the job. Applicants should have mechanical aptitude and be in good physical condition.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Machine tool operation/machine shop 27,303

Private noncollegiate postsecondary, 1981:
- Machine tool operations 4,878

Characteristics of entrants. Machine tool operators face temporary layoffs when economic conditions cause demand to slacken for products that use machined metal parts. Consequently, most entrants are experienced operators who have been on temporary layoff, between jobs, or temporarily employed in another occupation.

Numerical-control machine-tool operators

EMPLOYMENT PROFILE

Total employment, 1984 57,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Machinery manufacturing, except electrical	56.2
Aircraft and parts manufacturing	13.1
Fabricated metal product manufacturing	7.3
Electronic component and accessories manufacturing	5.2

	Low	Moderate	High
Projected 1995 employment	70,000	74,000	77,000
Percent change, 1984-95	23.9	30.5	35.4

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Most numerical-control machine-tool operators are promoted from shop helper or machine-tool operator. Employers prefer those who have had courses in shop math and blueprint reading. Most entrants learn their skills on the job by helping experienced workers and in courses offered by machine-tool manufacturers.

Photographic process workers

EMPLOYMENT PROFILE

Total employment, 1984 52,000

Selected characteristics of workers, 1984:

Percent female	51.3
Percent black	9.6
Age distribution (percent):	
16-24 years	32.2
25-54 years	60.3
55 and older	7.5
Percent employed part time, total	13.9
Percent employed part time, voluntary	9.8

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Miscellaneous business services (includes photofinishing, commercial testing, and research and development laboratories and related services)	53.6
Mailing, reproduction, commercial art, and stenographic services	14.4
Photographic and portrait studios	12.1
Motion pictures	7.2

	Low	Moderate	High
Projected 1995 employment	62,000	65,000	68,000
Percent change, 1984-95	21.2	26.8	31.8

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Most photographic process workers learn their skills on the job by assisting experienced workers. Employers prefer high school graduates. In addition, graduates of postsecondary programs in photographic technology have an advantage when looking for a job.

Characteristics of entrants. This is usually an entry level position. About half of all job openings are filled by persons who have not been working—recent high school graduates and persons who have been tending to family responsibilities or unemployed. The rest transfer from another occupation. A sizable proportion of entrants take a part-time job while still in school.

Precision assemblers

EMPLOYMENT PROFILE

Total employment, 1984 353,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Electronic component and accessories manufacturing	15.8
Office, computing, and accounting machine manufacturing	13.4
Communication equipment manufacturing	12.1
Aircraft and parts manufacturing	10.1
Measuring and controlling instrument manufacturing	5.2
Fabricated metal product manufacturing	5.2

	Low	Moderate	High
Projected 1995 employment	399,000	419,000	434,000
Percent change, 1984-95	13.0	18.6	23.1

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Employers seek workers who can do routine work at a fast pace. A high school diploma is helpful but is seldom required. For some types of assembly jobs, applicants may have to meet special requirements such as mechanical aptitude, good eyesight, or absence of color blindness. For still others, such as electronic assembly jobs, technical school or equivalent military training is required.

Printing press operators

EMPLOYMENT PROFILE

Total employment, 1984 222,000

Selected characteristics of workers, 1984:

Percent female	16.9
Percent black	7.6
Age distribution (percent):	
16-24 years	24.0
25-54 years	63.4
55 and older	12.6
Percent employed part time, total	5.0
Percent employed part time, voluntary	3.5

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Commercial printing	46.2
Newspapers	13.1
Paper and allied product manufacturing	10.9
Business services	5.4

	Low	Moderate	High
Projected 1995 employment	239,000	248,000	257,000
Percent change, 1984-95	7.4	11.7	15.7

Employment growth ..... Average

Annual separation rate (percent) ..... [1]13.4

[1]The number of separations may be artificially high. Employment in the occupation declined between 1983 and 1984; some workers who left were not replaced.

SUPPLY PROFILE

Usual entry and training requirements. Printing press operators generally learn their trade through informal on-the-job training or, less commonly, through apprenticeship training. Mechanical aptitude is required.

Characteristics of entrants. Most entrants are high school graduates. Entrants are about equally divided between those who have not been working—most have been on temporary layoff or are recent graduates of an apprenticeship program—and those who have transferred from another occupation.

Shoe and leather workers and repairers

EMPLOYMENT PROFILE

Total employment, 1984 43,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Footwear manufacturing, except rubber	59.5
Shoe repair, shoe shine, and hat cleaning shops	15.7

	Low	*Moderate*	*High*
Projected 1995 employment	34,000	35,000	37,000
Percent change, 1984-95	−22.8	−18.6	−15.1

Employment growth ..... Decline

SUPPLY PROFILE

Usual entry and training requirements. There are no formal education requirements; these workers generally learn their trade on the job, either through company training programs or working as a helper to experienced workers. They must have manual dexterity and mechanical aptitude to work with various machines and handtools. In addition, they need self-discipline because they often work alone with little or no supervision.

Stationary engineers

EMPLOYMENT PROFILE

Total employment, 1984 54,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Local government	16.0
Nondurable goods manufacturing	13.4
Hospitals	12.5
Durable goods manufacturing	10.9
Educational services	8.8
Federal Government	7.0
Communications and utilities	6.1

	Low	*Moderate*	*High*
Projected 1995 employment	56,000	58,000	61,000
Percent change, 1984-95	2.9	7.0	11.1

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. Skills are acquired through previous work experience as a helper to experienced engineers or through a formal apprenticeship. Employers and apprenticeship committees generally prefer high school or vocational school graduates. Many States and cities require stationary engineers to be licensed. To be licensed, applicants must be at least 18 years old, meet local residency and experience requirements, and pass a written examination. Mechanical aptitude, manual dexterity, and good physical condition are required.

Tool-and-die makers

EMPLOYMENT PROFILE

Total employment, 1984 165,000

Selected characteristics of workers, 1984:

Percent female	1.8
Percent black	3.8
Age distribution (percent):	
16-24 years	11.3
25-54 years	70.8
55 and older	17.9
Percent employed part time, total	1.5
Percent employed part time, voluntary	0.8

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Metalworking machinery and equipment manufacturing	23.1
Metal forgings and stampings	11.6
Electrical and electronic machinery and equipment manufacturing	11.6
Motor vehicle and equipment manufacturing	9.3
Aircraft and parts manufacturing	6.2

	Low	*Moderate*	*High*
Projected 1995 employment	172,000	181,000	188,000
Percent change, 1984-95	4.6	9.8	14.2

Employment growth ..... Slower than average

Annual separation rate (percent) 6.4

SUPPLY PROFILE

Usual entry and training requirements. Tool-and-die makers develop their skills informally on the job by working as a helper to experienced toolmakers and diemakers or through a formal appprenticeship program. Many employers and apprenticeship committees prefer persons with a high school or postsecondary school education. Applicants should have a working knowledge of mathematics and physics, as well as mechanical ability, finger dexterity, and an aptitude for precise work.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Tool and die making	1,044
Private noncollegiate postsecondary, 1981:	
Tool and die making	443

Characteristics of entrants. The majority of all openings are filled by persons who transfer from another occupation—primarily

another machining occupation or a helper position. Most of the remainder have been on temporary layoff, between jobs, or are recent graduates of an apprenticeship program. Because of the emphasis placed on work experience, entrants tend to be considerably older than entrants to other occupations.

Transportation equipment painters

EMPLOYMENT PROFILE

Total employment, 1984 60,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Automobile repair shops	47.1
Motor vehicle dealers (new and used)	27.0
Motor vehicle and equipment manufacturing	9.6

	Low	*Moderate*	*High*
Projected 1995 employment	66,000	69,000	72,000
Percent change, 1984-95	9.7	15.0	19.6

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Skills generally are acquired informally on the job by helping experienced workers. However, some transportation equipment painters obtain skills through employer-sponsored training programs or at community and junior colleges and postsecondary vocational schools. Good eyesight and color perception are required. Although graduation from high school is not required, it usually is an asset.

Upholsterers

EMPLOYMENT PROFILE

Total employment, 1984 63,000

Selected characteristics of workers, 1984:

Percent female	23.6
Percent black	8.2
Age distribution (percent):	
16-24 years	21.1
25-54 years	64.3
55 and older	14.6
Percent employed part time, total	20.0
Percent employed part time, voluntary	12.8

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Household furniture manufacturing	52.9
Reupholstery and furniture repair	22.2
Furniture and home furnishings stores	5.2

	Low	*Moderate*	*High*
Projected 1995 employment	66,000	69,000	72,000
Percent change, 1984-95	4.8	10.0	14.3

Employment growth ..... Slower than average

SUPPLY PROFILE

Usual entry and training requirements. There are no formal training requirements for this occupation. Upholsterers generally acquire their skills informally on the job. Nevertheless, employers prefer those who have completed technical training, in a high school, postsecondary vocational school, or community college. Manual dexterity, coordination, and an eye for detail are necessary.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Leatherworking and upholstering general; and upholstering	2,192
Private noncollegiate postsecondary, 1981:	
Upholstering	1,104

Characteristics of entrants. Most entrants have not been working—many are experienced workers returning to a job from which they had been laid off, and others have been in school. The remainder transfer from another occupation. Although most are high school graduates, few have any postsecondary training

Water and sewage treatment plant operators

EMPLOYMENT PROFILE

Total employment, 1984 82,000

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Local government	86.1
Utilities and sanitary services	5.1

	Low	*Moderate*	*High*
Projected 1995 employment	88,000	91,000	94,000
Percent change, 1984-95	8.3	11.5	14.7

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Water and sewage treatment plant operators usually learn on the job under the direction of an experienced operator. Employers generally prefer high school graduates; in some jurisdictions, this is required. Graduation from a postsecondary training program in wastewater technology is an advantage. In addition, most water pollution control agencies offer training courses to improve operators' skills and knowledge. Written examinations are required for jobs covered by civil service regulations. Applicants should have mechanical aptitude, basic mathematical ability, and physical agility.

Training completions:

Public vocational secondary and postsecondary, 1983:	
Water and wastewater technology	842

Welders and cutters

EMPLOYMENT PROFILE

Total employment, 1984 308,000

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Machinery manufacturing, except electrical	9.9
Miscellaneous repair shops and related services (includes welding repair services)	8.8
Motor vehicle and equipment manufacturing	6.7
Mining	6.6
Special trade contractors	6.3
Transportation, communications, and utilities	5.5
Heavy construction, except highway and street	5.3

	Low	Moderate	High
Projected 1995 employment	333,000	349,000	364,000
Percent change, 1984-95	8.0	13.1	18.1

Employment growth ..... Average

SUPPLY PROFILE

Usual entry and training requirements. Few employers have formal educational requirements. Many welders learn their craft through informal on-the-job instruction while they work as a welder's helper. Some new employees participate in company-sponsored training programs. In addition, training is available in high schools, postsecondary vocational schools, community colleges, and the Armed Forces. Physical requirements include manual dexterity, good eyesight and eye-hand coordination, and the ability to bend, stoop, and work in awkward positions.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Welding, brazing, and soldering 35,249

Transportation and Material Moving Occupations

Aircraft pilots

EMPLOYMENT PROFILE

Total employment, 1984 79,000

Selected characteristics of workers, 1984:
- Percent female 2.1
- Percent black 0.2
- Age distribution (percent):
  - 16-24 years 4.2
  - 25-54 years 84.9
  - 55 and older 10.9
- Percent employed part time, total 15.7
- Percent employed part time, voluntary 11.5

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Certified air transportation	60.9
Noncertified air transportation	9.5
Government	7.7

	Low	Moderate	High
Projected 1995 employment	94,000	97,000	101,000
Percent change, 1984-95	18.9	23.2	28.3

Employment growth ..... Faster than average

SUPPLY PROFILE

Usual entry and training requirements. Pilots must be licensed by the Federal Aviation Administration (FAA). Applicants for licensure must be at least 18 years old, have 250 hours of flying time, have vision correctable to 20/20, pass a physical exam, and demonstrate their flying ability to an FAA examiner. Flying skills are usually obtained in military or civilian flying schools. The ability to make quick decisions and accurate judgments under pressure is essential.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Air transportation, general; and airplane piloting and navigation 2,146

Associate degrees and other awards below baccalaureate, 1983:
- Air transportation, general; and airplane piloting and navigation 866

Busdrivers

EMPLOYMENT PROFILE

Total employment, 1984 459,000

Selected characteristics of workers, 1984:
- Percent female 44.3
- Percent black 23.5
- Age distribution (percent):
  - 16-24 years 8.9
  - 25-54 years 73.3
  - 55 and older 17.8
- Percent employed part time, total 43.1
- Percent employed part time, voluntary 27.2

Unemployment rate ..... About average

Industry concentration of wage and salary workers, 1984:

Industry	Percent
Educational services	53.7
School buses	15.7
Local government	12.8
Local and suburban transportation	5.0

	Low	Moderate	High
Projected 1995 employment	522,000	536,000	552,000
Percent change, 1984-95	13.8	16.9	20.4

Employment growth ..... Average

Annual separation rate (percent) 17.6

SUPPLY PROFILE

Usual entry and training requirements. In most jurisdictions, school busdrivers must be at least 18 years old. Local transit busdrivers must be at least 21, and most intercity buslines prefer drivers to be at least 24 years old. Good health and good vision, with or without glasses, are needed. Most jurisdictions require a chauffeur's or school bus license. Busdrivers acquire their skills through employer-sponsored training programs or informally on the job.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Truck and bus driving 3,144

Characteristics of entrants. The majority of entrants are at least 25 years old, have no more than a high school education, and begin in a part-time job; drivers may increase their work hours and get regularly scheduled routes as they advance in senority. Most jobs for school busdrivers are filled by students or homemakers attracted by the opportunity to work part time while engaged in other activities. Others transfer from another job or were between jobs.

Construction machinery operators

EMPLOYMENT PROFILE

Total employment, 1984 198,000

Selected characteristics of workers, 1984:

Percent female	1.7
Percent black	9.1
Age distribution (percent):	
16-24 years	11.3
25-54 years	75.1
55 and older	13.6
Percent employed part time, total	2.6
Percent employed part time, voluntary	1.2

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Heavy construction, except highway and street	30.2
Highway and street construction	25.8
Miscellaneous special trade contractors (includes structural steel, excavating and foundation, and wrecking and demolition contractors)	21.1
Nonresidential building construction	7.0
Residential building construction	6.2

	Low	*Moderate*	*High*
Projected 1995 employment	220,000	230,000	237,000
Percent change, 1984-95	11.1	16.2	19.9

Employment growth ..... Average

Annual separation rate (percent) 20.3

SUPPLY PROFILE

Usual entry and training requirements. Most construction machinery operators learn the trade by working as helpers to experienced operators. Some learn through a formal apprenticeship. Most employers prefer high school graduates who are at least 18 years old. Courses in automobile mechanics, experience in operating tractors and other farm machinery, and Armed Forces training in heavy equipment operation can be helpful. Applicants should have a good sense of balance as well as good eye-hand-foot coordination and physical strength.

Characteristics of entrants. Construction machinery operators may experience periodic layoffs when projects end and during declines in construction activity. Consequently, many entrants are experienced workers returning to the occupation after being unemployed or working temporarily in another occupation. Relatively few have more than a high school education.

Industrial truck and tractor operators

EMPLOYMENT PROFILE

Total employment, 1984 389,000

Selected characteristics of workers, 1984:

Percent female	5.3
Percent black	18.1
Age distribution (percent):	
16-24 years	20.9
25-54 years	69.5
55 and older	9.6
Percent employed part time, total	2.8
Percent employed part time, voluntary	1.3

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Wholesale trade	13.8
Food product manufacturing	9.6
Fabricated metal product manufacturing	6.5
Lumber and wood product manufacturing	5.9
Trucking and warehousing	5.6
Paper and allied product manufacturing	5.6
Primary metal manufacturing	5.3

	Low	*Moderate*	*High*
Projected 1995 employment	326,000	342,000	357,000
Percent change, 1984-95	−16.2	−11.9	−8.0

Employment growth ..... Decline

SUPPLY PROFILE

Usual entry and training requirements. Most industrial truck and tractor operators learn their skills on the job. Many companies have training programs that include instruction, demonstration, and practice with the industrial truck or tractor. Good eyesight, especially depth perception, is essential. Strength, stamina, and general physical fitness are also necessary.

Characteristics of entrants. Few entrants have more than a high school education. Most entrants enter from another occupation or have been unemployed. The remainder primarily are young people who have been in school.

Truckdrivers

EMPLOYMENT PROFILE

Total employment, 1984 2,484,000

Selected characteristics of workers, 1984:

Percent female	4.2
Percent black	12.9
Age distribution (percent):	
16-24 years	17.2
25-54 years	71.2
55 and older	11.6
Percent employed part time, total	8.7
Percent employed part time, voluntary	4.9

Unemployment rate ..... Higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Trucking, local and long distance	27.7
Services	7.6
Wholesale trade, durable goods	6.9
Durable goods manufacturing	6.6
Food product manufacturing	6.3
Groceries and related product wholesalers	6.2
Construction	5.0

	Low	*Moderate*	*High*
Projected 1995 employment	2,768,000	2,911,000	3,033,000
Percent change, 1984-95	11.4	17.2	22.1

Employment growth ..... Average

Annual separation rate (percent) 18.1

SUPPLY PROFILE

Usual entry and training requirements. By Federal law, truckdrivers engaged in interstate commerce must be at least 21 years old and pass written and physical examinations. In addition, a chauffeur's license may be required. Employers prefer applicants with a good driving record and previous experience driving a truck.

Training completions:

Public vocational secondary and postsecondary, 1983:
- Truck and bus driving 3,144

Private noncollegiate postsecondary, 1981:
- Truckdriving 34,995

Characteristics of entrants. About half of all entrants have not been working—many have been laid off or between jobs. Most of the remainder transfer from another occupation. Relatively few entrants have more than a high school education or enter directly from school.

Handlers, Equipment Cleaners, Helpers, and Laborers

Construction trades helpers

EMPLOYMENT PROFILE

Total employment, 1984 443,000

Selected characteristics of workers, 1984:
- Percent female 2.7
- Percent black 13.9
- Age distribution (percent):
  - 16-24 years 57.9
  - 25-54 years 39.2
  - 55 and older 2.9
- Percent employed part time, total 16.2
- Percent employed part time, voluntary 7.0

Unemployment rate ..... Much higher than average

Industry concentration of wage and salary workers, 1984:

Industry	*Percent*
Masonry, stonework, tilesetting, and plastering contractors	16.1
Residential building construction	16.0
Nonresidential building construction	10.8
Plumbing, heating, and air-conditioning contractors	9.4
Electrical contractors	9.3
Roofing and sheet-metal contractors	5.3

	Low	*Moderate*	*High*
Projected 1995 employment	449,000	470,000	486,000
Percent change, 1984-95	1.4	6.1	9.8

Employment growth ..... Slower than average

Annual separation rate (percent) 37.4

SUPPLY PROFILE

Usual entry and training requirements. There are usually no formal education requirements for this job. Applicants generally must be at least 18 years old, in good physical condition, and be willing to work hard.

Characteristics of entrants. Workers may experience periodic layoffs when construction projects end and during declines in construction activity. Consequently, the majority of entrants have not been working—most have been on temporary layoff, between jobs, or in school. The remaining entrants transfer from another occupation. Few entrants have any formal education beyond high school.

Appendix A. Assumptions and Methods Used in Preparing Employment Projections

The Bureau of Labor Statistics prepares projections on a 2-year cycle, using the Economic Growth Model System. This system is composed of a group of separate but related processes. Projections are produced in the following areas: (1) Labor force, (2) aggregate economic performance, (3) industry final demand and total industry production, (4) industry employment levels, and (5) occupational employment by industry. Each block of the projections depends upon inputs from an earlier stage and feeds logically into the next.

To develop the projections, assumptions are made concerning the population, fiscal and monetary policy, foreign economic conditions, energy, and other factors. Those variables having the largest impact on the projections are discussed below, first for a moderate-growth scenario and then for alternatives to moderate growth.

Moderate-growth assumptions

Population. The middle-growth projections of the U.S. population, developed by the Bureau of the Census in 1983, were chosen for the moderate-growth scenario. Between 1984 and 1995, the population age 16 and over is projected to increase 19.8 million, an average annual rate of growth of 1.0 percent. As in prior projections, the rate of population growth slows over the projection period, dropping from 1.2 percent annually between 1984 and 1990 to 0.8 percent a year between 1990 and 1995.

The civilian labor force is expected to grow slightly faster, reflecting generally increasing participation rates and the shift of persons into age categories with traditionally higher labor force participation. The civilian labor force is projected to attain a level of 129.2 million by 1995, an increase of about 15 million from 1984. This represents average annual growth of 1.3 percent for 1984-90, and 1 percent for 1990-95.

Fiscal policy. General fiscal restraint throughout the remainder of this decade is the basic assumption of the moderate-growth projection for government expenditure and tax policies. Federal defense purchases of goods and services are assumed to increase at a real rate of 5.3 percent a year between 1984 and 1990. Thereafter, growth is assumed to drop to the 1.0- to 1.5-percent range to 1995.

Nondefense purchases of goods and services in real terms are expected to increase in the 1984-90 period, reaching $35.4 billion in 1990, $4.3 billion above the 1984 level. This reflects some increase in employment as well as adjustments for inflation. After 1990, nondefense purchases are assumed to grow, in real terms, at a rate of 0.9 percent a year.

A modest growth path for other Federal expenditure categories has generally been assumed. No real growth is assumed for food stamp benefits, military retirement and veterans' benefits, Medicare payments, and Social Security payments during the 1984-90 period. Growth in these categories is a combination of inflation adjustment and client population shifts. After 1990, some resumption of growth in all of the expenditure categories mentioned above is assumed—on the order of 1-2 percent annually. Finally, Federal subsidy programs and grants to State and local governments are assumed to decline in real terms over the entire projection period.

Projected Federal revenues reflect current personal income tax rates and the indexation of personal taxes for the remainder of the period. The recent trend toward lower effective corporate profits tax rates is assumed to continue through 1995.

The net effect of these assumptions is a Federal budget deficit (National Income Product Account basis) that declines from $118 billion in 1984 to about $91 billion by 1995. Although the deficit remains high throughout the period, this represents a drop as a percent of GNP from 5 percent in 1984 to 3 percent by 1995.

Monetary policy. Monetary policy is best described as accommodative. Money supply growth (M2) has been set to parallel projected growth in nominal GNP. Thus, monetary policy does not interrupt growth by being too restrictive nor does it re-initiate the inflationary spiral of the 1970's by being too loose.

The money supply, which largely determines the level of interest rates, coupled with the decline in the Federal deficit as percent of GNP, brings both short-and-long-

term interest rates down, dropping about 3-4 percentage points over the 10-year horizon of the projections.

Foreign activity. Estimates of imports and exports are affected in the projections by both domestic and foreign economic activity. It is assumed that real economic growth for the major trading partners of the United States will more or less parallel real U.S. GNP growth. World gross domestic product (less that of the United States and centrally planned economies) is assumed to increase at an average annual rate of 3.5 percent between 1984 and 1990, and at a rate of 2.7 percent annually, 1990-95. The average gross domestic product deflator for the same economic grouping is assumed to increase at 5.6 percent annually and 5.1 percent annually for the 1984-90 and 1990-95 periods, respectively. Additionally, the weighted average exchange rate for the U.S. dollar is expected to drop vis-a-vis other currencies to approximately its 1980 level by 1995.

Energy. The price (in 1984 dollars) of imported crude oil (f.o.b) is assumed to decline from $28 per barrel in 1984 to $23 in 1995.

Unemployment. A target path for civilian unemployment was also selected. A smooth decline is assumed, from 7.5 percent in 1984 to 6.3 percent in 1990 and 6.0 percent in 1995.

General assumptions. Further assumptions include smooth growth with no business cycle fluctuations or major economic upheavals—such as major wars or price shocks.

Alternatives to moderate growth

The high- and low-growth versions of the projections have been prepared with variations in those responses to economic policy that have the greatest impact on industrial employment and occupational projections. Except for Federal spending programs that are responsive to economic stimuli, fiscal and monetary policies are the same for all three scenarios. By 1995, real GNP is expected to range between $2.2 and $3.5 trillion, accompanied by unemployment rates of 7.0 and 5.0 percent for the low and high projections, respectively. Each of the alternatives is summarized below.

High-growth. This alternative differs from the moderate-growth version primarily in the 1984-90 period. The assumptions underlying the high-growth scenario are that the civilian labor force will increase more rapidly than in the moderate-growth alternative, reaching 133 million by 1995, and the unemployment rate will drop to 5 percent. Also, productivity gains will be higher than those in the moderate-growth projections.

During the 1984-90 period, the high-growth alternative is characterized by a rate of real GNP growth of 4.0 percent annually, compared to 3.0 percent in the moderate-growth version. Between 1990 and 1995, real GNP growth is projected to be at rates of 3.5 and 2.8 percent, respectively.

Within GNP, the component most sensitive to the alternative assumptions is business investment, especially investment in equipment. This is largely because of a higher overall GNP, lower interest rates, and a decline in the user cost of capital relative to labor.

Higher income growth in this set of projections affects several significant areas. Purchases of consumer durables are expected to be $43.1 billion higher than in the moderate-growth version. Greater income growth also leads to increased demand for imports. However, favorable world economic conditions and a stable rate of inflation will spark demand for U.S. exports, thus creating a trade surplus of $25.2 billion. Finally, higher rates of income growth mean greater government revenues, which lead to a balanced Federal budget by 1995.

Although Federal expenditures are the same in all three versions, State and local government spending is projected to vary. Expenditures by States and localities are expected to be $357.9 billion in the high-growth alternative, compared to $345.9 billion in the moderate-growth version.

Low-growth. In this alternative, a relatively more consumer-oriented growth path is assumed, with less relative investment growth and much lower productivity. It also assumes the labor force will expand less rapidly and the unemployment rate will not improve over current levels.

Real GNP is projected to be $234 billion lower than in the moderate-growth scenario. Slower economic growth has a significant effect upon purchases of consumer durables and business investment. Consumption of consumer durables is 6.5 percent below the moderate-growth scenario. By 1995, total investment is 7.6 percent below the moderate-growth version. Dampened capital goods spending leads to lower productivity over the entire period.

Although a lower level of economic activity will reduce the demand for imports, export growth will be hampered even more. The result will be a trade deficit of $47 billion for the low-growth alternative, which is significantly greater than the $12 billion deficit projected by the moderate-growth case.

With lower receipts forthcoming from a sluggish economy, the Federal deficit in nominal terms is projected to reach nearly $500 billion by 1995, versus $267.9 billion in the moderate-growth case. Like Federal receipts, those of States and localities are projected to decline. Because State and local government spending is closely tied to

revenues, spending in the low-growth scenario is projected to be $28 billion below the moderate-growth alternative.

Projection methods

The *labor force projections* are developed from Bureau of the Census population projections by age, sex, and race, based on trends in birth rates, death rates, and net migration. BLS projects labor force participation rates—the percent of each group in the population who will be working or seeking work—for 82 age, sex, and race groups. The labor force participation rate for each group is developed by: (a) Analyzing past rates of change over the 1962-84 period or for selected subperiods; (b) selecting the rate for a period deemed most appropriate for each group; and (c) modifying that rate if past trends are judged not likely to continue throughout the entire projection period. The levels of the anticipated labor force are then calculated by applying the projected participation rates to the Bureau of the Census population projections.

The *aggregate economic projections,* or *gross national product,* in total and by major demand and income category, start with the BLS labor force and Census population projections as inputs. Consistent economic scenarios are developed to provide aggregate controls for the various categories of demand and employment. These scenarios are selected to encompass a likely range of economic growth in the future. Later stages of the projection process develop industry-level projections consistent with these aggregate data.

The model used by the Bureau to develop aggregate economic projections is selected through a competitive procurement process. The most recent award was to Wharton Econometrics. The Wharton long-term model is a system of behavioral relationships and identities based on annual data and designed to allow an analyst to explore the determinants of medium- to long-term growth in the U.S. economy. Made up of approximately 2,400 equations, the model is driven by a set of 900 exogenous variables. Under the terms of the agreement, the Bureau uses the Wharton long-term macroeconomic model to develop the BLS projections. However, assumptions and values for exogenous variables and equation adjustments are determined by BLS analysts in the process of delineating the alternative projections to be developed.

The exogenous variables include true policy variables, such as various Federal transfer programs, the response of the monetary authority to growth in the economy, and the level of the Armed Forces. They also include variables for which other reliable and generally accepted projections are available, such as the population projections developed by the U.S. Bureau of the Census. Finally, the exogenous variables incude those items that the model was not designed to project or that are simply too volatile for statistical methods to yield reliable results. The former group includes such items as economic growth and inflation rates in the economies of the major trading partners of the United States and the long-term behavior of the U.S. dollar's exchange value. The latter group includes items such as energy prices.

For the *industry output projections*, the U.S. economy is disaggregated to 156 producing sectors, an exhaustive grouping which combines both the public and private sectors. The framework is an input-output model prepared for a base period by the Bureau of Economic Analysis of the U.S. Department of Commerce. The first step at the industry level is to disaggregate the GNP estimate to a set of demands by industry which matches the industry detail in the input-output model. This projected industry demand, in conjunction with a projected input-output table, is used to calculate total industrial production. The projected changes in input-output coefficients in the input-output model capture—among other factors—expected changes in technology. Finally, the employment necessary to produce those levels of output is estimated through the use of projected industry productivity measures.

Aggregate demand projections are available from the macro model for 14 categories of consumption, 4 types of investment, 15 end-use categories of foreign trade, and 6 categories of government spending. Where possible, a further disaggregation of the control values is undertaken: Purchases of producers' durable equipment, for example, are estimated for 107 consuming industries. Government spending in each of the six functional areas is separated among new construction, employee compensation, and all other expenditures.

To allow for shifts in the composition of aggregate demand and in the industrial makeup of a given demand category, "bridge tables" are projected. The bridge table is a percent distribution for each given demand category, such as for a consumption category or for investment, among each of the 156 industries in the BLS input-output model. In projecting changes in these bridge tables, expected changes in consumer tastes or buying patterns, in the industrial pattern of exports and imports, or in the future composition of each industry's business investment are considered. The bridge table distributions also reflect the effects of technological and other structural changes on the economy.

The projection of the input-output table accounts for the changes in the input pattern for each industry. In general, two types of changes are made: (a) Those made to the inputs of a specific industry (as the changes in inputs in the aluminum industry); and, (b) those made to the inputs of all or most industries for a specific commodity or service (as for increased use of business services across a wide spectrum of industries). These changes are based on studies of specific industries conducted internally or by other organizations both within and outside of government. Changing the projected input patterns in the input-output table is the procedure

used to accommodate the impact of expected relative price changes or changes in technology. Output requirements by industry are the result of multiplying the projected input-output table by projected changes in the level and distribution of final demand.

The projected changes in industry output are important factors determining the *projections of industry employment*. However, converting output projections into employment estimates requires projections of changes in productivity and average hours for each industry. This is accomplished using a regression model with an equation for each industry that estimates worker hours as a function of the following variables: (1) The industry's output, (2) aggregate capacity utilization, (3) the relative price of labor, and (4) a technology variable as approximated by the output/capital ratio. Worker hours are then converted into jobs by dividing by average annual hours, which are projected from past trends. The sum of employment by industry is controlled to total employment as estimated in the macro model. Several iterations are usually necessary to achieve a reasonable balance.

Projections of employment for the 156 sectors in the Economic Growth Model are disaggregated to 378 industries corresponding to the 3-digit Standard Industrial Classification (SIC). This is done to match the industry mix of the industry-occupation matrix described later. The disaggregated 3-digit SIC industry employment projections are reviewed in light of a broad range of economic information. When the industry projections are considered final, they are used as inputs to the process of projecting occupational employment.

One of the main resources in making *occupational employment projections* is the industry-occupation matrix. This matrix is produced from data collected by State employment security agencies and brought together by the Bureau of Labor Statistics to produce national estimates. The data are collected from employers on a 3-year cycle—manufacturing one year, some nonmanufacturing industries the next year, and the rest of nonmanufacturing the final year. The staffing patterns for each industry are benchmarked to industry employment levels for the base year of the projections. Industry data for each occupation are summed to develop national employment estimates. The matrix contains over 550 detailed occupations, although most industries do not have employment in many of these occupations.

The major occupational cells of the industry-occupation matrix for the base year are reviewed and adjustments are made to the cells in the projected matrix to account for expected changes resulting from technological change, shifts in the product mix, and other factors. The changes introduced into the input-output model for expected technological change may also change the future staffing patterns in industries using the new technology. (For example, one would expect greater employment of computer specialists as computer technology spreads across industries.) The projected industry employment data are applied to the projected industry occupational-employment patterns and the results are aggregated to yield total occupational employment for the projected year.

For a more detailed discussion of the projections process, see *Employment Projections for 1995: Data and Methods,* Bulletin 2253 (Bureau of Labor Statistics, 1986).

Appendix B. Detailed Occupational Projections

This appendix presents 1984 employment for 500 detailed occupations with 5,000 workers or more, three alternative 1995 projections (see discussion of projections in appendix A), and the 1984-95 percent change.

Table B-1. Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Total, all occupations	106,842.9	117,268.3	122,760.5	127,718.2	9.8	14.9	19.5
Managerial and management-related occupations	11,274.3	13,139.3	13,761.5	14,309.5	16.5	22.1	26.9
Managerial and administrative occupations	8,832.8	10,247.0	10,739.1	11,176.3	16.0	21.6	26.5
Elementary and secondary school principals and assistant principals	124.6	133.2	137.0	141.5	6.9	10.0	13.6
Food service and lodging managers	656.7	711.4	745.9	777.7	8.3	13.6	18.4
Public adminstrators, chief executives, legislators, and general administrators	141.0	153.6	157.8	162.1	9.0	12.0	15.0
All other managers and administrators	7,910.5	9,248.8	9,698.3	10,095.0	16.9	22.6	27.6
Management support occupations	2,441.5	2,892.4	3,022.5	3,133.2	18.5	23.8	28.3
Accountants and auditors	881.9	1,134.6	1,188.5	1,235.3	28.7	34.8	40.1
Assessors	19.9	21.6	22.2	22.8	8.6	11.5	14.5
Claims examiners, property and casualty insurance	22.7	27.7	29.2	30.3	22.1	28.4	33.4
Compliance and enforcement inspectors, except construction	121.5	128.7	131.2	133.6	5.9	8.0	9.9
Construction and building inspectors	55.1	57.6	59.2	60.7	4.4	7.4	10.0
Cost estimators	114.4	129.6	135.7	140.4	13.3	18.6	22.7
Personnel specialists and related workers	319.2	365.4	381.0	394.1	14.5	19.3	23.5
Claims takers, unemployment benefits	23.3	22.7	23.4	24.0	−2.5	.1	2.8
Employment interviewers, private or public employment service	71.9	90.5	94.6	98.1	25.9	31.7	36.6
Personnel, training, and labor relations specialists	198.2	223.2	232.4	240.1	12.6	17.3	21.2
Special agents, insurance	25.8	28.9	30.5	31.8	11.9	18.3	23.3
Purchasing agents and buyers	417.9	460.4	482.2	500.4	10.2	15.4	19.8
Purchasing agents, except wholesale, retail, and farm products	188.6	216.4	224.5	231.7	14.7	19.1	22.9
Wholesale and retail buyers, except farm products	229.3	244.0	257.6	268.7	6.4	12.4	17.2
Tax examiners, collectors, and revenue agents	52.2	50.5	50.7	50.9	−3.3	−2.8	−2.5
Underwriters	78.1	90.1	95.3	99.5	15.4	22.1	27.4
All other management support workers	358.5	426.2	447.3	465.2	18.9	24.8	29.8
Engineers, architects, and surveyors	1,468.3	1,895.7	1,979.7	2,050.5	29.1	34.8	39.7
Engineers	1,331.2	1,734.4	1,811.4	1,876.7	30.3	36.1	41.0
Aeronautical and astronautical engineers	48.1	59.9	62.3	63.9	24.6	29.5	32.9
Chemical engineers	56.0	66.1	69.4	72.3	18.0	23.9	29.0
Civil engineers, including traffic engineers	175.3	214.0	221.8	228.7	22.1	26.5	30.5
Electrical and electronics engineers	390.5	571.4	596.6	617.2	46.3	52.8	58.1
Industrial engineers, except safety engineers	124.9	154.1	161.7	168.2	23.4	29.4	34.7
Mechanical engineers	236.7	303.1	317.3	329.5	28.0	34.0	39.2

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Metallurgists and metallurgical, ceramic, and materials engineers	19.1	22.3	23.4	24.6	16.7	22.8	29.2
Mining engineers, including mine safety engineers	7.2	7.3	7.6	7.8	1.6	5.5	8.9
Nuclear engineers	9.7	10.2	10.5	10.8	5.1	8.7	11.5
Petroleum engineers	22.3	24.8	26.1	27.2	11.3	16.9	21.9
Other engineers	241.4	301.2	314.7	326.4	24.8	30.4	35.2
Architects, including landscape architects	93.0	112.8	118.1	122.0	21.3	27.0	31.2
Surveyors	44.1	48.5	50.2	51.8	9.9	13.9	17.5
Natural, computer, and mathematical scientists	657.7	886.3	920.9	950.9	34.8	40.0	44.6
Computer systems analysts, electronic data processing	308.1	497.8	519.8	538.7	61.5	68.7	74.8
Life scientists	112.8	126.0	129.1	132.1	11.7	14.5	17.1
Agricultural and food scientists	20.2	22.4	23.0	23.5	11.1	14.0	16.6
Biological scientists	54.2	61.9	63.6	65.2	14.3	17.4	20.4
Foresters and conservation scientists	25.3	26.8	27.0	27.3	6.0	7.0	8.1
All other life scientists	13.1	14.8	15.4	16.0	12.9	17.4	22.1
Mathematical scientists	51.0	60.6	62.7	64.5	18.7	22.9	26.5
Actuaries	7.7	11.0	11.6	12.1	43.6	51.5	58.0
Statisticians	22.7	25.5	26.5	27.3	12.5	16.6	20.2
Mathematicians and all other mathematical scientists	20.6	24.0	24.6	25.1	16.3	19.2	21.6
Physical scientists	185.7	202.0	209.3	215.6	8.8	12.7	16.1
Chemists	85.5	90.1	94.0	97.3	5.4	10.0	13.9
Geologists, geophysicists, and oceanographers	46.2	51.4	53.1	54.6	11.1	14.8	18.0
Meteorologists	5.5	6.2	6.4	6.4	13.5	15.6	17.4
Physicists and astronomers	19.5	20.7	21.2	21.7	5.8	8.7	11.1
All other physical scientists	29.0	33.7	34.6	35.5	16.1	19.4	22.5
Social scientists	185.9	211.6	219.2	225.6	13.8	17.9	21.4
Economists	38.2	44.2	45.5	46.6	15.8	19.2	22.2
Psychologists	96.9	113.1	118.0	122.1	16.7	21.8	26.0
Sociologists	5.6	5.8	5.9	6.1	2.8	5.8	8.8
Urban and regional planners	17.1	18.1	18.7	19.2	6.1	9.1	12.1
All other social scientists	28.1	30.4	31.1	31.7	8.1	10.5	12.5
Social, recreational, and religious workers	788.9	878.4	910.4	946.4	11.3	15.4	20.0
Clergy	296.4	303.4	315.0	328.4	2.4	6.3	10.8
Directors, religious activities and education	34.2	35.0	36.3	37.9	2.4	6.1	10.8
Recreation workers	122.9	143.8	149.1	154.9	17.1	21.3	26.1
Social workers	335.5	396.1	410.1	425.2	18.1	22.2	26.8
Lawyers and judges	523.5	674.3	704.7	731.7	28.8	34.6	39.8
Judges, magistrates, and other judicial workers	33.1	39.2	40.2	41.2	18.5	21.4	24.3
Lawyers	490.4	635.1	664.5	690.5	29.5	35.5	40.8
Teachers, librarians, and counselors	4,509.7	4,815.0	4,965.5	5,131.2	6.8	10.1	13.8
Teachers, preschool, kindergarten, and elementary	1,659.7	1,921.9	1,981.1	2,046.7	15.8	19.4	23.3
Teachers, preschool	278.3	306.8	319.1	330.2	10.3	14.7	18.7
Teachers, kindergarten and elementary	1,381.4	1,615.1	1,662.0	1,716.5	16.9	20.3	24.3
Teachers, secondary school	1,045.3	1,062.2	1,093.0	1,128.7	1.6	4.6	8.0
College and university faculty	731.3	635.7	654.1	675.5	−13.1	−10.6	−7.6
Other teachers and instructors	747.1	833.2	863.7	894.5	11.5	15.6	19.7
Farm and home management advisors	26.7	23.4	24.1	24.9	−12.3	−9.6	−6.7
Graduate assistants, teaching	145.4	133.5	137.4	141.9	−8.2	−5.5	−2.4
Instructors, adult (nonvocational) education	131.7	160.8	165.7	170.9	22.1	25.8	29.7
Teachers and instructors, vocational education and training	124.4	133.7	138.2	143.0	7.5	11.1	15.0
All other teachers and instructors	318.8	381.7	398.3	413.7	19.7	24.9	29.8
Librarians, archivists, curators, and related workers	174.1	186.2	191.8	197.9	7.0	10.2	13.7

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Audio-visual specialists	7.8	8.3	8.6	8.9	7.4	10.5	13.9
Curators, archivists, museum technicians, and restorers	11.4	12.0	12.2	12.5	4.6	6.9	9.7
Librarians	154.9	165.9	171.0	176.5	7.1	10.4	14.0
Counselors	152.3	175.7	181.7	188.0	15.4	19.3	23.5
Health diagnosing and treating occupations	2,609.8	3,203.5	3,348.7	3,489.2	22.8	28.3	33.7
Chiropractors	31.4	38.9	40.4	42.2	23.9	28.9	34.4
Dentists	156.1	184.6	195.2	203.0	18.2	25.1	30.0
Dietitians and nutritionists	47.7	57.9	60.0	62.3	21.5	25.8	30.7
Opticians, dispensing and measuring	41.5	48.9	51.1	53.5	17.7	23.2	29.0
Optometrists	28.7	34.5	36.3	38.4	20.3	26.7	33.9
Pharmacists	151.5	158.5	166.1	173.3	4.6	9.7	14.4
Podiatrists	10.9	14.8	15.2	15.6	35.6	38.9	43.1
Physician assistants	25.1	33.4	35.2	36.6	33.2	40.3	46.0
Physicians and surgeons	475.7	556.4	584.9	607.2	17.0	23.0	27.6
Registered nurses	1,376.8	1,753.1	1,828.8	1,908.4	27.3	32.8	38.6
Therapists	224.9	275.8	287.1	298.7	22.6	27.7	32.8
Occupational therapists	25.5	32.2	33.4	34.8	26.5	31.3	36.7
Physical therapists	58.3	79.1	83.0	86.4	35.5	42.2	48.1
Recreational therapists	17.2	20.4	21.1	21.9	18.7	22.7	27.4
Respiratory therapists	54.9	63.5	66.3	69.5	15.6	20.8	26.5
Speech pathologists and audiologists	47.1	53.5	55.2	57.0	13.8	17.3	21.1
All other therapists	21.9	27.1	28.1	29.2	23.4	28.1	33.0
Veterinarians and veterinary inspectors	39.6	46.7	48.4	49.9	18.0	22.3	26.2
Writers, artists, entertainers, and athletes	1,192.3	1,405.8	1,472.9	1,529.8	17.9	23.5	28.3
Artists and commercial artists	203.9	251.8	263.9	273.8	23.5	29.4	34.3
Dancers and choreographers	10.1	11.9	12.3	12.7	17.2	21.1	25.1
Designers, except interior designers	205.0	239.0	251.0	260.8	16.6	22.4	27.2
Merchandise displayers and window trimmers	20.0	22.3	23.4	24.3	11.3	16.5	21.1
Musicians	191.5	207.7	217.2	226.3	8.5	13.4	18.1
Photographers and camera operators	100.7	123.4	129.4	134.2	22.6	28.6	33.3
Producers, directors, actors, and entertainers	49.6	58.1	60.9	63.1	17.3	22.9	27.4
Public relations specialists and publicity writers	95.0	119.4	125.1	129.6	25.7	31.6	36.4
Radio and TV announcers and newscasters	56.1	59.9	62.4	65.2	6.7	11.3	16.2
Reporters and correspondents	69.0	78.6	82.4	85.8	13.9	19.3	24.2
Writers and editors, including technical writers	191.3	233.7	244.8	254.0	22.2	28.0	32.8
Technician occupations	3,049.1	3,769.6	3,935.4	4,087.7	23.6	29.1	34.1
Health technicians and technologists	1,188.5	1,328.9	1,387.8	1,447.0	11.8	16.8	21.8
Dental hygienists	76.2	92.0	98.1	102.1	20.8	28.7	34.0
Dietetic technicians	15.8	18.4	19.1	20.0	16.4	20.5	26.2
Electrocardiograph technicians/ technologists	21.1	23.5	24.4	25.3	11.8	15.8	20.0
Electroencephalograph technicians/ technologists	5.9	6.7	7.0	7.3	14.1	19.6	25.1
Emergency medical technicians	47.1	49.0	50.5	52.1	3.9	7.1	10.6
Licensed practical nurses	601.9	680.1	708.0	738.8	13.0	17.6	22.7
Medical and clinical laboratory technologists and technicians	236.4	242.6	254.1	264.8	2.6	7.5	12.0
Medical records technicians and technologists	33.3	42.1	43.8	45.6	26.4	31.4	37.0
Radiologic technologists and technicians	114.5	134.7	141.4	147.6	17.6	23.5	28.9
Surgical technicians	36.3	39.7	41.5	43.4	9.4	14.3	19.7
Engineering and science technicians and technologists	1,314.2	1,614.8	1,685.7	1,746.9	22.9	28.3	32.9
Engineering technicians	730.1	978.1	1,022.1	1,059.5	34.0	40.0	45.1
Civil engineering technicians and technologists	58.3	71.5	74.4	77.1	22.5	27.6	32.2

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Electrical and electronics technicians and technologists	404.4	579.1	606.5	629.4	43.2	50.0	55.7
Industrial engineering technicians and technologists	26.9	32.2	33.9	35.3	20.0	26.1	31.4
Mechanical engineering technicians and technologists	54.9	71.4	75.0	78.1	30.0	36.6	42.2
All other engineering technicians and technologists	185.6	223.9	232.3	239.5	20.6	25.1	29.0
Drafters	345.2	366.5	384.2	399.7	6.2	11.3	15.8
Physical and life science technicians and technologists	238.9	270.2	279.4	287.7	13.1	16.9	20.4
Technicians, except health, engineering, and science	546.4	825.9	861.9	893.8	51.1	57.7	63.6
Air traffic controllers	21.9	22.4	22.0	21.5	2.3	.5	−1.5
Broadcast technicians	24.9	29.0	30.0	31.1	16.3	20.5	24.9
Computer programmers	341.1	558.9	585.8	609.1	63.8	71.7	78.5
Paralegal personnel	52.7	99.9	104.1	108.0	89.5	97.5	104.9
Programmers, numerical, tool, and process control	10.6	13.4	14.0	14.6	26.0	32.2	37.4
Radio operators	7.1	7.6	7.8	8.1	7.3	10.7	14.2
Technical assistants, library	42.2	44.8	46.0	47.3	6.2	9.0	12.2
Title examiners, searchers, and clerks	20.5	24.1	25.3	26.6	17.7	23.6	29.6
All other professional, paraprofessional, and technical workers	1,050.9	1,221.0	1,266.5	1,308.5	16.2	20.5	24.5
Marketing and sales occupations	11,172.7	12,697.5	13,393.0	13,989.8	13.6	19.9	25.2
Cashiers	1,902.0	2,343.0	2,468.5	2,578.7	23.2	29.8	35.6
Counter and rental clerks	96.0	93.1	97.6	101.3	−3.0	1.7	5.6
Insurance sales workers	371.1	383.9	405.0	422.0	3.4	9.1	13.7
Manufacturing sales workers	[1] 547.0	569.0	598.0	623.0	4.0	9.3	13.8
Real estate agents and brokers	362.5	395.5	414.8	431.6	9.1	14.4	19.0
Brokers, real estate	42.7	47.8	49.7	51.6	11.8	16.3	20.8
Sales agents, real estate	319.8	347.8	365.1	379.9	8.7	14.2	18.8
Real estate appraisers	37.5	42.3	44.5	45.7	12.6	18.7	21.8
Salespersons, retail	2,732.2	2,916.1	3,075.2	3,212.6	6.7	12.6	17.6
Securities and financial services sales workers	81.3	107.0	113.1	117.6	31.7	39.1	44.7
Stock clerks, sales floor	574.1	607.2	640.8	669.9	5.8	11.6	16.7
Travel agents	71.8	98.1	103.3	107.7	36.6	43.9	50.0
Wholesale trade sales workers	[1] 1,248.0	1,536.0	1,617.0	1,688.0	23.1	29.6	35.3
All other sales and related workers	4,944.0	5,711.2	6,030.2	6,302.8	15.5	22.0	27.5
Administrative support occupations, including clerical	18,716.4	19,572.0	20,499.3	21,332.3	4.6	9.5	14.0
Adjusters and investigators	529.8	603.4	631.6	655.0	13.9	19.2	23.6
Adjustment clerks	64.5	73.8	77.8	81.3	14.3	20.5	26.0
Bill and account collectors	115.2	136.8	143.7	149.6	18.7	24.7	29.9
Insurance adjusters, examiners, and investigators	133.9	158.1	165.6	171.5	18.1	23.7	28.1
Insurance appraisers, auto damage	7.0	7.4	7.8	8.2	6.0	11.9	16.9
Insurance claims and policy processing clerks	124.6	131.7	138.1	143.0	5.7	10.8	14.7
License clerks	13.3	15.0	15.4	15.8	12.9	16.0	19.1
Welfare eligibility workers and interviewers	59.5	67.6	69.5	71.3	13.6	16.8	19.9
Communications equipment operators	472.5	534.6	561.3	585.0	13.2	18.8	23.8
Telephone operators	456.3	519.2	545.1	568.2	13.8	19.5	24.5
Central office operators	76.7	64.3	67.8	70.9	−16.1	−11.5	−7.5
Directory assistance operators	32.2	28.4	30.0	31.3	−11.6	−6.8	−2.5
Switchboard operators	347.5	426.4	447.2	465.9	22.7	28.7	34.1
Telegraph and teletype operators	7.5	6.0	6.3	6.6	−19.1	−15.2	−11.1
All other communications equipment operators	8.7	9.4	9.8	10.2	7.3	12.7	17.2

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Computer operators and peripheral equipment operators	311.5	433.9	454.3	472.1	39.3	45.9	51.6
Computer operators, except peripheral equipment	241.5	337.1	352.8	366.5	39.6	46.1	51.8
Peripheral EDP equipment operators	70.0	96.8	101.5	105.6	38.3	45.0	50.8
Duplicating, mail, and other office machine operators	153.0	170.3	178.3	185.3	11.3	16.5	21.1
Financial records processing occupations	2,629.3	2,675.9	2,812.3	2,929.4	1.8	7.0	11.4
Billing, cost, and rate clerks	215.6	240.4	253.7	264.8	11.5	17.6	22.8
Billing, posting, and calculating machine operators	233.6	258.3	271.7	283.4	10.6	16.3	21.3
Bookkeeping, accounting, and auditing clerks	1,972.8	1,989.7	2,090.8	2,177.5	.9	6.0	10.4
Payroll and timekeeping clerks	207.3	187.5	196.1	203.7	−9.5	−5.4	−1.7
Information clerks	737.4	809.9	854.9	894.5	9.8	15.9	21.3
Hotel desk clerks	98.7	108.6	115.9	121.9	10.0	17.4	23.5
New accounts clerks, banking	71.6	77.7	81.7	85.2	8.5	14.1	19.0
Receptionists and information clerks	458.2	512.3	541.6	566.3	11.8	18.2	23.6
Reservation and transportation ticket agents and travel clerks	108.9	111.4	115.7	121.0	2.3	6.3	11.2
Mail and message distribution workers	801.5	756.6	796.3	841.8	−5.6	−.7	5.0
Mail clerks, except mailing machine operators and postal service	136.4	134.8	139.8	144.1	−1.1	2.5	5.7
Messengers	67.2	74.1	77.6	80.8	10.3	15.6	20.3
Postal mail carriers	281.0	273.4	289.0	308.0	−2.7	2.8	9.6
Postal service clerks	317.0	274.2	289.9	308.9	−13.5	−8.5	−2.5
Material recording, scheduling, dispatching, and distributing occupations	2,416.8	2,426.4	2,545.2	2,650.4	.4	5.3	9.7
Dispatchers	203.0	224.7	234.6	243.4	10.7	15.6	19.9
Dispatchers, except police, fire, and ambulance	144.2	161.2	169.3	176.4	11.8	17.4	22.3
Dispatchers, police, fire, and ambulance	58.8	63.5	65.2	67.0	8.0	11.0	14.0
Meter readers, utilities	50.1	50.6	52.9	54.9	1.1	5.6	9.7
Order fillers, wholesale and retail sales	226.0	208.1	219.2	228.8	−7.9	−3.0	1.2
Procurement clerks	52.7	56.1	58.2	60.0	6.5	10.3	13.8
Production, planning, and expediting clerks	213.6	222.4	232.9	242.4	4.1	9.0	13.5
Stock clerks, stockroom, warehouse, or yard	787.8	734.1	771.7	804.6	−6.8	−2.0	2.1
Traffic, shipping, and receiving clerks	650.8	676.3	711.3	742.1	3.9	9.3	14.0
Weighers, measurers, checkers, and samplers, recordkeeping	37.1	37.1	38.9	40.9	.1	5.1	10.3
All other material recording, scheduling, and distributing workers	195.8	216.9	225.6	233.4	10.7	15.2	19.2
Records processing occupations, except financial	893.4	956.9	1,000.8	1,039.9	7.1	12.0	16.4
Advertising clerks	11.0	12.8	13.3	13.7	16.5	21.4	25.4
Brokerage clerks	29.3	33.3	35.1	36.5	13.5	19.6	24.6
File clerks	288.8	281.7	295.8	307.8	−2.4	2.4	6.6
Library assistants and bookmobile drivers	122.0	130.5	134.4	138.6	7.0	10.1	13.6
Order clerks; material, merchandise, and service	297.3	337.2	354.7	370.1	13.4	19.3	24.5
Personnel clerks, except payroll and timekeeping	108.4	122.6	126.9	130.8	13.1	17.1	20.6
Statement clerks	36.6	38.8	40.7	42.4	5.9	11.0	15.6
Secretaries, stenographers, and typists	4,027.2	4,027.4	4,209.2	4,371.8	.0	4.5	8.6
Secretaries	2,796.7	2,927.7	3,064.4	3,186.1	4.7	9.6	13.9
Stenographers	239.4	137.6	142.9	147.8	−42.5	−40.3	−38.3
Typists	991.1	962.0	1,001.9	1,037.8	−2.9	1.1	4.7
Other clerical and administrative support workers	5,743.9	6,176.7	6,455.2	6,707.1	7.5	12.4	16.8
Court clerks	33.1	39.5	40.6	41.7	19.3	22.5	25.8

See footnote at end of table.

Table 2-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Credit checkers	33.8	40.7	42.6	44.2	20.5	26.0	30.7
Customer service representatives, utilities	92.0	102.6	108.2	113.2	11.5	17.7	23.1
Data entry keyers, except composing	324.3	318.2	334.2	347.2	-1.6	3.1	7.1
Data keyers, composing	21.5	26.9	28.0	29.0	25.1	30.4	35.1
General office clerks	2,397.9	2,510.6	2,628.8	2,733.8	4.7	9.6	14.0
Loan and credit clerks	122.7	136.7	143.8	150.0	11.4	17.2	22.2
Municipal clerks	19.0	20.4	21.0	21.6	7.4	10.4	13.3
Proofreaders and copy markers	21.5	24.6	25.7	26.7	14.3	19.4	23.9
Real estate clerks	17.2	19.4	20.1	20.7	12.2	16.4	20.2
Statistical clerks	93.1	77.8	81.3	84.4	-16.4	-12.7	-9.3
Teacher aides and educational assistants	478.6	548.2	566.4	586.0	14.6	18.3	22.4
Tellers	492.6	491.7	516.8	539.1	-.2	4.9	9.4
All other clerical and administrative support workers	1,608.3	1,831.3	1,911.6	1,984.1	13.9	18.9	23.4
Service occupations	16,581.5	18,890.8	19,728.1	20,547.3	13.9	19.0	23.9
Building service occupations	2,981.1	3,273.8	3,425.1	3,565.5	9.8	14.9	19.6
Janitors and cleaners, including maids and housekeeping cleaners	2,940.2	3,233.3	3,382.8	3,521.9	10.0	15.1	19.8
Pest controllers and assistants	40.9	40.5	42.3	43.7	-.8	3.4	6.9
Food and beverage preparers and service occupations	6,636.7	7,771.7	8,130.0	8,489.8	17.1	22.5	27.9
Bakers, bread and pastry	67.6	76.3	80.5	84.4	12.9	19.1	25.0
Bartenders	400.4	489.2	512.1	535.1	22.2	27.9	33.6
Cooks, except short order	884.3	1,049.6	1,094.7	1,139.9	18.7	23.8	28.9
Cooks, institutional or cafeteria	421.2	477.9	493.9	512.4	13.5	17.3	21.7
Cooks, restaurant	463.1	571.6	600.8	627.5	23.4	29.7	35.5
Cooks, short order and specialty fast food	425.2	476.4	498.9	521.4	12.0	17.3	22.6
Dining room and cafeteria attendants and barroom helpers	307.4	363.8	381.4	398.9	18.3	24.1	29.8
Food preparation and service workers, fast food	1,201.5	1,353.6	1,416.8	1,480.9	12.7	17.9	23.3
Food preparation workers, except fast food	986.7	1,155.3	1,205.2	1,258.1	17.1	22.1	27.5
Hosts and hostesses; restaurant, lounge, and coffee shop	131.5	160.2	168.0	175.7	21.8	27.7	33.5
Waiters and waitresses	1,624.6	1,953.1	2,048.7	2,142.0	20.2	26.1	31.8
All other food service workers	607.5	694.4	723.6	753.4	14.3	19.1	24.0
Health service and related occupations	1,665.9	2,080.5	2,163.6	2,258.6	24.9	29.9	35.6
Ambulance drivers and attendants, except EMTs	23.0	24.0	24.7	25.4	4.6	7.5	10.6
Dental assistants	169.2	203.8	217.2	226.0	20.5	28.4	33.6
Medical assistants	127.7	195.0	206.8	216.0	52.7	62.0	69.1
Nursing aides and psychiatric aides	1,268.0	1,567.2	1,620.6	1,692.5	23.6	27.8	33.5
Nursing aides, orderlies, and attendants	1,204.4	1,501.4	1,552.0	1,620.6	24.7	28.9	34.6
Psychiatric aides	63.6	65.7	68.6	71.9	3.4	8.0	13.1
Occupational therapy assistants and aides	8.0	8.7	9.0	9.3	7.7	11.5	16.1
Pharmacy assistants	37.3	41.7	43.4	45.3	11.8	16.5	21.5
Physical and correctional therapy assistants and aides	32.8	40.2	41.9	44.1	22.6	27.9	34.6
Personal service occupations	1,574.5	1,782.2	1,869.8	1,949.7	13.2	18.8	23.8
Amusement and recreation attendants	149.3	181.2	188.6	195.7	21.4	26.3	31.1
Baggage porters and bellhops	31.0	31.3	33.2	34.8	.9	7.0	12.3
Barbers	94.3	94.2	98.4	103.7	-.1	4.5	10.0
Childcare workers	571.6	595.9	626.2	651.3	4.2	9.5	13.9
Cosmetologists and related workers	523.6	639.2	673.8	703.9	22.1	28.7	34.4
Flight attendants	64.5	74.4	77.4	81.1	15.5	20.0	25.8
Social welfare service aides	98.2	121.8	126.5	131.5	24.1	28.8	34.0
Ushers, lobby attendants, and ticket takers	42.0	44.1	45.7	47.5	5.0	8.7	13.1
Private household workers	993.0	777.8	811.2	839.9	-21.7	-18.3	-15.4

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Protective service occupations	1,923.8	2,226.9	2,306.3	2,379.2	15.8	19.9	23.7
Correction officers and jailers	129.8	170.6	175.1	179.5	31.4	34.9	38.3
Firefighting occupations	307.7	346.8	355.8	364.8	12.7	15.6	18.6
Firefighters	242.6	273.4	280.3	287.3	12.7	15.5	18.4
Firefighting and prevention supervisors	56.6	64.1	65.9	67.6	13.4	16.4	19.6
Fire inspectors	8.5	9.3	9.6	9.9	9.7	12.9	16.5
Police and detectives	520.3	571.7	585.9	600.2	9.9	12.6	15.4
Police and detective supervisors	103.9	113.1	115.8	118.4	8.8	11.4	14.0
Police detectives and investigators	63.6	68.8	69.8	70.7	8.2	9.6	11.0
Police patrol officers	352.8	389.7	400.4	411.1	10.5	13.5	16.5
Crossing guards	75.5	79.9	82.1	84.4	5.9	8.8	11.9
Guards	733.0	878.8	920.9	957.6	19.9	25.6	30.6
All other protective service workers	157.5	179.1	186.5	192.6	13.7	18.5	22.3
All other service occupations	806.5	977.9	1,022.2	1,065.1	21.2	26.7	32.1
Agriculture, forestry, fishing, and related occupations	3,554.4	3,290.6	3,446.7	3,566.6	−7.4	−3.0	.3
Supervisors; farming, forestry, and agriculture related occupations	82.1	75.5	78.4	80.8	−8.1	−4.5	−1.6
Agriculture-related occupations	740.1	798.3	830.1	857.2	7.9	12.2	15.8
Animal caretakers, except farm	68.8	77.5	80.6	82.5	12.7	17.2	19.9
Gardeners and groundskeepers, except farm	650.3	699.3	727.1	751.8	7.5	11.8	15.6
Graders and sorters, agricultural products	21.0	21.5	22.3	22.9	2.0	5.9	8.7
Farm workers	1,079.0	911.1	958.1	988.2	−15.6	−11.2	−8.4
Farmers and farm managers	1,442.4	1,315.4	1,380.4	1,431.5	−8.8	−4.3	−.8
Fishers, hunters, and trappers	46.1	41.9	44.2	47.0	−9.1	−4.2	2.1
Forestry and logging occupations	135.0	119.4	125.4	131.0	−11.5	−7.1	−3.0
All other agriculture, forestry, fishery, and related workers	29.6	29.0	30.1	30.9	−2.2	1.7	4.4
Blue-collar worker supervisors	1,469.9	1,481.0	1,555.2	1,622.4	.7	5.8	10.4
Construction trades	3,346.8	3,583.1	3,743.1	3,877.2	7.1	11.8	15.8
Air hammer operators	9.8	10.2	10.6	11.0	3.6	8.3	11.8
Bricklayers and stone masons	140.3	147.9	155.2	160.7	5.4	10.6	14.5
Carpenters	944.2	997.9	1,045.6	1,084.7	5.7	10.7	14.9
Carpet installers	70.8	78.3	82.1	85.5	10.6	15.9	20.8
Ceiling tile installers and acoustical carpenters	24.9	27.6	28.7	29.5	10.9	15.1	18.4
Concrete and terrazzo finishers	105.7	117.9	122.9	126.6	11.5	16.2	19.7
Drywall installers and finishers	105.9	112.2	117.1	121.0	6.0	10.6	14.3
Drywall installers	61.6	65.5	68.7	71.4	6.2	11.6	15.9
Tapers	30.8	33.1	34.3	35.1	7.7	11.4	14.1
Lathers	13.5	13.6	14.1	14.4	.8	4.3	7.0
Electricians	544.9	606.1	633.1	656.6	11.2	16.2	20.5
Glaziers	37.1	42.8	44.3	46.5	15.2	20.8	25.3
Hard tile setters	25.0	27.2	28.0	28.6	8.7	11.8	14.2
Highway maintenance workers	142.5	146.8	150.6	154.8	3.0	5.8	8.6
Insulation workers	52.3	57.0	59.4	61.3	9.0	13.6	17.2
Painters and paperhangers	378.0	378.0	395.0	409.2	.0	4.5	8.3
Pipelayers and pipelaying fitters	48.4	53.6	55.8	57.6	10.7	15.3	18.9
Plasterers	20.8	20.9	21.6	22.2	.3	3.9	6.6
Plumbers, pipefitters, and steamfitters	394.6	436.3	455.3	471.5	10.6	15.4	19.5
Roofers	121.8	132.0	138.1	143.2	8.4	13.4	17.5
Structural and reinforcing metal workers	86.5	98.2	102.4	105.8	13.5	18.5	22.3
Reinforcing metal workers	34.7	39.4	41.2	42.5	13.8	18.8	22.5
Structural metal workers	51.8	58.7	61.3	63.3	13.3	18.3	22.2
All other construction trades workers	93.1	92.2	96.7	101.0	−1.0	3.8	8.4
Extractive and related workers, including blasters	175.5	170.0	177.6	183.6	−3.1	1.2	4.6
Blasters and explosives workers	9.6	9.0	9.5	9.9	−5.7	−.7	3.5
Continuous mining machine operators	6.5	6.7	6.8	7.0	2.5	5.1	7.4
Derrick operators, oil and gas extraction	15.4	15.8	16.5	17.0	2.6	7.0	10.3
Mine cutting and channeling machine operators	11.3	9.7	10.1	10.5	−14.4	−10.5	−7.4

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Rotary drill operators, oil and gas extraction	24.4	25.0	26.1	27.0	2.5	7.1	10.6
Roustabouts	80.9	77.0	80.7	83.6	-4.8	-.3	3.3
All other extractive workers, except helpers	27.3	26.7	27.7	28.5	-2.1	1.6	4.6
Mechanics, installers, and repairers	4,391.1	4,805.5	5,037.7	5,246.6	9.4	14.7	19.5
Communications equipment mechanics, installation and repair	72.9	71.8	75.6	79.0	-1.5	3.7	8.3
Central office and PBX installers and repairers	39.4	42.1	44.4	46.4	6.7	12.5	17.6
Frame wirers, central office	14.4	11.7	12.4	12.9	-18.6	-14.1	-10.3
Radio mechanics	8.7	9.3	9.7	10.1	6.7	11.6	16.1
Signal or track switch maintainers	6.8	5.0	5.2	5.4	-26.8	-23.7	-19.8
All other communication equipment mechanics, installation and repair	3.6	3.8	4.0	4.2	4.8	10.6	15.6
Electrical and electronic equipment mechanics, installers, and repairers	503.4	530.3	556.7	579.5	5.4	10.6	15.1
Data processing equipment repairers	49.9	74.3	77.9	81.1	48.8	56.2	62.6
Electrical installers and repairers, transportation equipment, manufacturing	5.6	6.1	6.4	6.6	8.8	14.3	18.9
Electrical powerline installers and repairers	21.4	24.2	25.5	26.6	12.9	19.0	24.3
Electric motor, transformer, and related repairers	24.7	28.5	29.8	30.9	15.2	20.6	25.1
Electronic home entertainment equipment repairers	52.4	56.0	59.3	62.3	6.9	13.2	18.9
Electronics repairers, commercial and industrial equipment	55.6	61.8	63.7	65.5	11.1	14.4	17.6
Station installers and repairers, telephone	110.9	86.9	91.6	95.7	-21.6	-17.4	-13.8
Telephone and cable TV line installers and repairers	182.8	192.6	202.4	210.8	5.4	10.8	15.4
Machinery and related mechanics, installers and repairers	1,452.5	1,558.6	1,631.9	1,702.3	7.3	12.4	17.2
Industrial machinery mechanics	429.9	442.9	463.7	483.5	3.0	7.9	12.5
Machinery maintenance mechanics, marine equipment	26.9	28.6	29.9	31.1	6.2	10.9	15.4
Machinery maintenance mechanics, sewing machine	13.2	10.4	11.0	11.5	-21.0	-16.7	-12.9
Machinery maintenance mechanics, textile machine	26.0	21.0	22.1	23.3	-19.1	-14.8	-10.2
Machinery maintenance mechanics, water and power plant	32.5	34.2	35.9	37.2	5.4	10.4	14.5
Mine machinery mechanics	10.6	9.9	10.3	10.7	-6.3	-2.6	1.7
All other machinery maintenance mechanics	320.8	338.8	354.6	369.7	5.6	10.5	15.2
Machinery maintenance workers	60.6	60.9	63.9	66.7	.5	5.5	10.1
Maintenance repairers, general utility	878.1	970.1	1,014.9	1,057.0	10.5	15.6	20.4
Millwrights	83.9	84.7	89.4	95.1	1.0	6.6	13.3
Vehicle and mobile equipment mechanics and repairers	1,576.8	1,785.9	1,874.2	1,950.6	13.3	18.9	23.7
Aircraft mechanics and engine specialists	106.4	121.6	124.8	128.4	14.3	17.3	20.7
Automotive body and related repairers	183.1	204.0	215.2	224.0	11.4	17.5	22.3
Automotive and motorcycle mechanics	921.8	1,052.5	1,107.3	1,154.0	14.2	20.1	25.2
Bus and truck mechanics and diesel engine specialists	210.7	246.3	258.9	270.0	16.9	22.8	28.1
Farm equipment mechanics	17.9	18.8	19.5	20.1	5.3	9.4	12.7
Mobile heavy equipment mechanics, except engines	77.2	86.1	89.1	91.8	11.6	15.4	18.9
Rail car repairers	26.9	20.1	20.9	22.0	-25.4	-22.3	-18.3
Small engine specialists	32.7	36.5	38.4	40.3	11.6	17.5	23.1
Other mechanics, installers, and repairers	785.6	859.0	899.3	935.2	9.3	14.5	19.0
Bicycle repairers	10.8	11.5	11.9	12.3	6.7	10.5	13.8

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Coin and vending machine servicers and repairers	32.9	35.8	37.8	39.5	8.9	14.9	20.2
Electric meter installers and repairers	9.1	10.4	10.9	11.4	13.5	19.3	24.4
Electromedical and biomedical equipment repairers	6.9	7.6	7.9	8.2	10.1	14.6	19.2
Heating, air-conditioning, and refrigeration mechanics and installers	173.5	193.6	202.5	210.1	11.6	16.7	21.1
Home appliance and power tool repairers	83.0	87.1	92.1	96.5	5.0	11.0	16.3
Mobile home repairers	9.6	9.7	10.5	11.3	1.0	9.2	17.9
Musical instrument repairers and tuners	9.2	9.8	10.1	10.4	6.3	9.7	12.7
Office machine and cash register servicers	52.5	65.1	68.3	71.1	23.9	30.0	35.4
Precision instrument repairers	57.2	62.5	65.4	68.1	9.4	14.4	19.2
Riggers	22.0	23.6	24.6	25.7	7.5	12.0	17.1
Tire repairers and changers	84.9	91.0	96.1	100.4	7.1	13.1	18.2
Watchmakers	14.3	15.3	15.6	16.0	6.5	9.0	11.7
All other mechanics, installers, and repairers	219.7	236.0	245.6	254.1	7.4	11.8	15.6
Precision production occupations	2,853.6	2,991.8	3,140.4	3,265.8	4.8	10.1	14.4
Precision food workers	302.4	280.1	293.1	304.2	−7.4	−3.1	.6
Bakers, manufacturing	48.1	47.5	49.6	51.6	−1.3	3.1	7.3
Butchers and meatcutters	221.5	203.1	212.6	220.4	−8.3	−4.0	−.5
Food batchmakers	21.0	18.0	18.8	19.6	−14.5	−10.4	−6.5
All other precision food and related workers	11.7	11.5	12.1	12.5	−1.9	3.0	6.9
Precision metal workers	943.7	995.5	1,044.1	1,084.4	5.5	10.6	14.9
Boilermakers	37.5	39.6	41.4	43.1	5.6	10.4	14.8
Etchers and engravers, hand or machine, precision	8.9	9.5	9.8	10.1	7.3	11.0	14.0
Hand workers, jewelry and related products, precision	8.8	7.4	7.9	8.3	−15.8	−10.0	−6.1
Jewelers and silversmiths	32.4	33.0	35.1	37.1	1.6	8.3	14.5
Layout workers, metal, precision	21.0	22.4	23.5	24.4	6.8	12.1	16.5
Machinists	354.2	371.7	391.2	407.1	5.0	10.5	14.9
Pattern and model makers, metal	12.7	12.4	13.1	13.6	−1.9	3.1	7.4
Sheet-metal workers	232.4	254.4	265.1	273.6	9.5	14.1	17.8
Shipfitters	13.9	14.6	15.1	15.6	5.4	8.9	12.5
Tool-and-die makers	164.8	172.3	181.0	188.2	4.6	9.8	14.2
All other precision metal workers	57.2	58.0	60.8	63.2	1.5	6.3	10.5
Precision printing workers	113.0	124.7	129.4	133.9	10.4	14.5	18.5
Bookbinders	11.3	12.1	12.6	13.0	7.4	11.4	15.3
Compositors, typesetters, and arrangers, precision	36.9	39.4	40.7	42.0	6.6	10.4	13.8
Lithography and photoengraving workers, precision	45.3	50.8	52.8	54.7	12.2	16.5	20.8
All other precision printing workers	19.5	22.4	23.3	24.2	14.8	19.4	23.9
Precision textile, apparel, and furnishings workers	266.0	259.3	273.0	283.8	−2.5	2.6	6.7
Custom tailors and sewers	127.4	133.5	140.5	146.0	4.8	10.3	14.6
Patternmakers and layout workers, fabrics and apparel	14.0	11.3	11.9	12.5	−19.2	−14.7	−11.0
Shoe and leather workers and repairers, precision	43.4	33.5	35.3	36.8	−22.8	−18.6	−15.1
Upholsterers	62.6	65.6	68.9	71.6	4.8	10.0	14.3
All other precision textile, apparel, and furnishings workers	18.6	15.4	16.3	16.9	−17.2	−12.8	−9.2
Precision woodworkers	199.3	219.4	231.2	240.5	10.1	16.0	20.7
Cabinetmakers and bench carpenters	99.2	112.5	118.5	123.0	13.4	19.4	24.0
Furniture finishers	33.7	35.1	37.3	39.1	4.0	10.4	15.9
Pattern and model makers, wood	11.6	12.6	13.1	13.6	7.8	12.8	16.9
Wood machinists	45.0	49.0	51.8	53.8	8.9	15.0	19.5
All other precision woodworkers	9.7	10.1	10.6	11.0	4.6	9.6	13.5
Inspectors and related occupations	688.8	731.9	769.0	801.8	6.3	11.6	16.4
Inspectors, testers, and graders, precision	253.5	287.9	302.2	314.6	13.6	19.2	24.1
Other production inspectors, testers, graders, and sorters	435.3	444.0	466.8	487.1	2.0	7.2	11.9

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Other precision workers	340.4	380.9	400.6	417.2	11.9	17.7	22.6
Dental laboratory technicians, precision	51.3	57.2	61.3	64.3	11.4	19.4	25.3
Foundry mold and core makers, precision	21.5	20.9	21.9	22.8	-3.0	1.7	6.1
Molders and shapers, except jewelry and foundry, precision	9.8	10.3	10.7	11.1	4.7	9.1	13.0
Patternmakers, model makers, and related workers, precision	6.7	6.9	7.2	7.4	4.0	7.7	11.1
Photographic process workers, precision	25.1	30.5	31.9	33.1	21.2	26.9	31.8
All other precision workers	225.9	255.2	267.7	278.4	12.9	18.5	23.2
Machine setters, set-up operators, operators, and tenders	5,552.8	5,472.2	5,748.3	5,996.1	-1.5	3.5	8.0
Numerical-control machine-tool operators and tenders, metal and plastic	56.8	70.3	74.1	76.9	23.9	30.5	35.4
Combination machine tool setters, set-up operators, operators, and tenders	107.6	130.8	136.3	140.9	21.6	26.7	30.9
Machine tool cutters and formers setters, operators, and tenders, metal and plastic	845.7	779.3	820.1	857.4	-7.9	-3.0	1.4
Drilling machine tool setters and set-up operators, metal and plastic	64.3	61.0	64.2	66.7	-5.2	-.2	3.8
Extruding and drawing machine setters and set-up operators, metal and plastic	27.7	23.7	25.2	27.1	-14.3	-9.1	-2.1
Forging machine setters and set-up operators, metal and plastic	17.8	15.6	16.4	17.1	-12.4	-8.1	-3.9
Grinding machine setters and set-up operators, metal and plastic	94.5	89.4	94.0	97.8	-5.4	-.5	3.4
Lathe machine tool setters and set-up operators, metal and plastic	97.9	92.9	97.9	101.9	-5.1	.0	4.1
Machine forming operators and tenders, metal and plastic	171.4	156.9	164.9	172.6	-8.5	-3.8	.7
Machine tool cutter operators and tenders, metal and plastic	170.3	154.8	162.7	169.6	-9.1	-4.5	-.4
Milling machine setters and set-up operators, metal and plastic	35.4	33.5	35.3	36.7	-5.2	-.2	3.7
Press machine setters and set-up operators, metal and plastic	48.3	44.5	46.7	48.8	-7.8	-3.2	1.0
Punching machine setters and set-up operators, metal and plastic	63.2	58.3	61.3	63.9	-7.7	-3.0	1.2
Rolling machine setters and set-up operators, metal and plastic	15.4	12.3	13.1	14.5	-20.2	-14.6	-5.4
Sawing machine tool setters and set-up operators, metal and plastic	18.2	17.1	18.0	18.8	-6.0	-1.0	3.5
Shear machine setters and set-up operators, metal and plastic	21.3	19.3	20.5	21.8	-9.2	-4.0	2.2
Metal fabricating machine setters, operators, and related workers	191.8	220.0	231.0	240.3	14.7	20.5	25.3
Metal fabricators, structural metal products	43.6	50.9	53.3	55.0	16.9	22.3	26.3
Soldering and brazer machine operators, tenders, setters, and set-up operators	17.9	20.1	21.2	22.0	12.6	18.5	23.2
Welding machine operators, tenders, setters, and set-up operators	130.3	148.9	156.5	163.3	14.3	20.1	25.3
Metal and plastic process machine setters, operators, and related workers	303.7	342.5	362.1	382.2	12.8	19.2	25.9
Electric plating machine operators, tenders, setters, and set-up operators, metal and plastic	48.2	54.6	57.5	60.1	13.4	19.4	24.7
Foundry mold assembly and shakeout workers	6.0	5.2	5.5	5.9	-14.0	-8.4	-1.7
Furnace operators and tenders	22.1	21.5	22.8	24.6	-2.9	3.1	11.3
Heaters, metal and plastic	5.5	5.4	5.8	6.4	-2.1	4.8	15.9
Heating equipment setters and set-up operators, metal and plastic	7.6	8.0	8.4	8.8	4.7	10.3	16.1
Heat treating machine operators and tenders, metal and plastic	21.2	21.3	22.4	23.8	.4	5.7	12.3

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Metal molding machine operators, tenders, setters, and set-up operators	37.1	37.6	39.7	41.8	1.3	6.9	12.5
Nonelectric plating machine operators, tenders, setters, and set-up operators, metal and plastic	12.2	13.9	14.6	15.4	13.7	19.9	26.1
Plastic molding machine operators, tenders, setters, and set-up operators	143.7	175.0	185.3	195.4	21.8	29.0	36.0
All other metal and plastic machine setters, operators, and related workers	95.3	102.7	107.8	113.1	7.7	13.1	18.6
Printing, binding, and related workers	406.7	442.6	460.9	477.9	8.8	13.3	17.5
Bindery machine operators, setters, and set-up operators	69.6	79.1	82.4	85.6	13.6	18.3	23.0
Printing press operations	222.1	238.6	248.0	256.9	7.4	11.7	15.7
Letterpress setters and set-up operators	20.6	18.9	19.6	20.4	−8.2	−4.6	−1.1
Offset lithographic press setters and set-up operators	69.5	75.8	78.5	81.1	9.2	13.0	16.7
Printing press machine operators and tenders	112.8	122.9	128.1	133.1	8.9	13.6	17.9
All other printing press setters and set-up operators	19.2	21.0	21.8	22.4	9.4	13.4	16.7
Photoengraving and lithographic machine operators and tenders	9.1	10.4	10.9	11.3	14.7	20.1	24.8
Photoengraving and lithographing photographers	20.2	23.3	24.2	25.1	15.6	20.1	24.4
Screen printing machine setters and set-up operators	14.6	15.1	15.8	16.4	3.2	8.0	12.4
Typesetting and composing machine operators and tenders	35.8	37.9	39.4	40.8	5.6	9.9	13.8
All other printing, binding, and related workers	35.2	38.2	40.1	41.7	8.6	13.9	18.5
Textile and related setters, operators, and related workers	1,422.1	1,189.7	1,252.7	1,309.6	−16.3	−11.9	−7.9
Extruding and forming machine operators and tenders, synthetic fiber	18.7	16.9	17.8	18.5	−9.4	−4.8	−.8
Laundry and drycleaning machine operators and tenders, except pressers	125.3	134.4	140.9	147.8	7.3	12.5	18.0
Pressing machine operators and tenders, textile, garment, and related	116.2	100.8	106.0	110.4	−13.3	−8.8	−5.1
Sewing machine operators, garment	675.6	534.3	563.1	586.4	−20.9	−16.7	−13.2
Sewing machine operators, non-garment	135.6	128.2	135.1	141.7	−5.4	−.4	4.5
Shoe sewing machine operators and tenders	32.8	21.0	22.5	23.8	−36.1	−31.5	−27.7
Textile bleaching and dyeing machine operators and tenders	23.3	18.8	19.8	20.9	−19.3	−14.9	−10.4
Textile draw-out machine operators and tenders	16.1	12.2	12.8	13.5	−24.4	−20.3	−16.1
Textile machine operators, tenders, setters, and set-up operators, winding	278.5	223.0	234.7	246.7	−19.9	−15.7	−11.4
Woodworking machine setters, operators, and other related workers	145.1	149.5	156.7	161.9	3.0	8.0	11.6
Head sawyers	9.9	9.6	9.9	10.1	−2.7	.1	2.2
Sawing machine operators, tenders, setters, and set-up operators	62.5	64.7	67.9	70.3	3.4	8.6	12.4
Woodworking machine operators tenders, setters, and set-up operators	72.6	75.2	78.8	81.5	3.5	8.5	12.2
Other machine setters, set-up operators, and tenders	1,978.2	2,044.9	2,146.7	2,236.0	3.4	8.5	13.0
Boiler operators and tenders, low pressure	44.2	45.4	47.1	48.8	2.8	6.6	10.4
Cementing and gluing machine operators and tenders	44.5	42.4	44.7	46.4	−4.7	.4	4.2
Chemical equipment controllers, operators, and tenders	77.0	75.2	79.2	82.6	−2.2	3.0	7.4
Cooking machine operators and tenders, food and tobacco	14.2	12.7	13.4	14.0	−10.3	−5.6	−1.8

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Crushing and mixing machine operators and tenders	122.3	119.1	125.2	130.9	-2.6	2.4	7.0
Cutting and slicing machine operators and tenders	61.5	59.0	61.9	64.3	-3.9	.8	4.6
Dairy processing equipment operators, including setters	16.3	13.5	14.1	14.7	-17.2	-13.3	-9.3
Electronic semiconductor processors	30.4	36.2	38.1	39.5	18.9	25.4	29.9
Extruding and forming machine operators and tenders	70.9	72.1	75.9	79.3	1.7	7.0	11.9
Furnace, kiln, or kettle operators and tenders	62.8	47.1	49.7	52.1	-25.0	-20.9	-17.0
Motion picture projectionists	15.5	13.6	14.0	14.6	-12.6	-9.8	-5.8
Packaging and filling machine operators and tenders	369.0	381.9	401.8	419.3	3.5	8.9	13.6
Painting machine operators and tenders	68.8	72.1	76.0	79.4	4.8	10.4	15.4
Painters, transportation equipment	60.4	66.2	69.5	72.2	9.7	15.0	19.6
Paper goods machine setters and set-up operators	60.4	59.2	62.5	64.8	-2.1	3.5	7.3
Photographic processing machine operators and tenders	26.4	31.9	33.4	34.8	20.9	26.8	31.8
Roasting machine operators and tenders, food and tobacco	12.1	10.6	11.1	11.5	-12.4	-8.5	-4.9
Separating and still machine operators and tenders	23.6	22.5	23.7	24.9	-4.9	.2	5.2
Tire building machine operators	13.4	10.0	10.4	11.1	-25.8	-22.7	-17.3
All other machine operators, tenders, setters, and set-up operators	784.4	854.2	894.9	930.7	8.9	14.1	18.6
Hand working occupations, including assemblers and fabricators	2,624.2	2,755.0	2,893.1	3,015.0	5.0	10.3	14.9
Precision assemblers	352.8	398.7	418.6	434.4	13.0	18.6	23.1
Aircraft assemblers, precision	21.0	22.9	24.1	24.9	8.7	14.5	18.2
Electrical and electronic equipment assemblers, precision	175.9	195.6	205.1	212.6	11.2	16.6	20.9
Electromechanical equipment assemblers, precision	61.3	71.8	75.3	78.2	17.1	22.8	27.6
Fitters, structural metal, precision	14.3	16.9	17.7	18.3	17.7	23.5	27.8
Machine builders and other precision machine assemblers	52.2	60.5	63.7	66.1	15.8	21.9	26.7
Watch and clock assemblers and related workers, precision	3.9	3.7	4.0	4.4	-3.2	2.8	12.6
All other precision assemblers, metal	24.1	27.4	28.7	29.8	13.4	19.0	23.6
Other hand workers, including assemblers and fabricators	2,271.4	2,356.3	2,474.6	2,580.6	3.7	8.9	13.6
Cannery workers	77.0	67.7	71.6	74.5	-12.1	-7.0	-3.3
Cutters and trimmers, hand	49.5	43.6	46.0	48.2	-11.9	-7.0	-2.7
Electrical and electronic assemblers	259.4	287.6	301.6	313.1	10.9	16.2	20.7
Machine assemblers	51.5	58.7	61.5	64.1	14.0	19.6	24.5
Meat, poultry, and fish cutters and trimmers, hand	98.0	89.8	93.1	95.5	-8.4	-5.0	-2.6
Metal pourers and casters, basic shapes	12.5	12.0	12.8	13.8	-3.9	2.3	10.5
Molders and casters, hand	17.1	16.8	17.3	17.8	-1.9	1.3	4.5
Painting, coating, and decorating workers, hand	40.7	42.6	45.0	47.4	4.6	10.7	16.6
Portable machine cutters	18.2	13.5	14.3	14.9	-25.5	-21.4	-17.8
Pressers, hand	21.6	17.7	18.7	19.4	-18.0	-13.6	-9.9
Sewers, hand	15.7	11.6	12.3	12.9	-26.1	-21.7	-17.9
Welders and cutters	308.2	332.9	348.7	363.8	8.0	13.1	18.1
All other assemblers, fabricators, and hand workers	1,302.1	1,361.9	1,431.7	1,495.3	4.6	10.0	14.8
Plant and system occupations	275.1	285.2	297.3	308.7	3.7	8.1	12.2
Chemical plant and system operators	35.0	34.5	36.4	38.0	-1.4	3.9	8.6
Gaugers	5.7	5.2	5.5	5.8	-7.9	-4.0	1.4
Petroleum refinery and control panel operators	14.5	13.4	13.9	14.5	-8.0	-4.1	-.5

See footnote at end of table.

Table B-1. Continued—Civilian employment in occupations with 5,000 workers or more, actual 1984 and projected 1995

Occupation	Total employment (in thousands)				Percent change, 1984-95		
	1984	1995			Low trend	Moderate trend	High trend
		Low trend	Moderate trend	High trend			
Power distributors and dispatchers	26.1	28.6	30.3	31.6	9.8	16.2	21.3
Stationary engineers	54.5	56.0	58.3	60.5	2.9	7.0	11.1
Water and liquid waste treatment plant and system operators	81.6	88.3	90.9	93.5	8.3	11.5	14.7
All other plant and system operators	57.8	59.1	62.1	64.8	2.2	7.4	12.1
Transportation and material moving machine and vehicle operators	4,677.8	4,968.6	5,206.3	5,418.0	6.2	11.3	15.8
Aircraft pilots and flight engineers	78.7	93.6	97.0	101.0	18.9	23.2	28.3
Motor vehicle operators	3,061.2	3,422.1	3,586.1	3,728.9	11.8	17.1	21.8
Busdrivers	458.9	522.0	536.3	552.4	13.8	16.9	20.4
Busdrivers, local and intercity	131.2	145.5	149.2	153.3	10.9	13.7	16.8
Busdrivers, school	327.7	376.6	387.1	399.1	14.9	18.1	21.8
Taxi drivers and chauffeurs	118.4	131.9	138.4	143.5	11.4	16.8	21.1
Truck drivers	2,483.8	2,768.2	2,911.5	3,033.0	11.4	17.2	22.1
Rail transportation workers	112.8	84.2	87.9	92.7	-25.4	-22.1	-17.8
Locomotive engineers	14.1	11.2	11.6	12.3	-20.9	-17.5	-13.2
Locomotive firers	6.3	4.2	4.4	4.6	-34.2	-31.4	-27.8
Railroad brake, signal, and switch operators	47.6	33.5	35.0	37.0	-29.7	-26.4	-22.1
Railroad conductors and yardmasters	23.8	17.5	18.2	19.1	-26.5	-23.4	-19.5
Rail yard engineers, dinkey operators, and hostlers	15.2	11.5	12.1	13.0	-24.1	-20.1	-14.7
Subway and streetcar operators	5.8	6.4	6.5	6.7	10.1	13.1	16.1
Water transportation and related workers	56.4	57.4	59.7	62.0	1.7	5.8	9.8
Captains, water vessel	17.6	18.1	18.7	19.3	2.8	6.4	9.9
Mates and able seamen	10.8	11.1	11.6	12.1	2.7	7.3	11.7
Ordinary seamen and marine oilers	17.9	18.3	19.0	19.8	1.9	6.2	10.5
Ship engineers	10.2	10.0	10.4	10.8	-1.6	2.4	6.3
Parking lot attendants	40.4	39.5	41.7	43.5	-2.3	3.1	7.7
Service station attendants	302.8	281.4	297.1	309.8	-7.1	-1.9	2.3
Material moving equipment operators	928.5	896.2	937.9	976.5	-3.5	1.0	5.2
Conveyor operators and tenders	37.9	37.0	38.9	40.8	-2.3	2.7	7.8
Hoist, winch, and crane operators	103.5	109.6	115.4	122.3	5.9	11.5	18.1
Industrial truck and tractor operators	388.6	325.7	342.3	357.4	-16.2	-11.9	-8.0
Loading machine operators, underground mining	6.1	6.0	6.3	6.5	-2.5	1.9	6.2
Oil pumpers, except well head	16.4	15.6	16.4	17.1	-5.1	.0	4.6
Operating engineers	357.4	384.8	400.3	413.4	7.6	12.0	15.6
Shuttle car operators	9.3	8.6	8.9	9.1	-7.4	-4.9	-2.7
Well head pumpers	9.1	8.9	9.4	9.8	-2.3	2.8	7.2
All other transportation and material moving equipment operators	96.9	94.1	98.8	103.6	-2.8	2.0	7.0
Helpers, laborers, and material movers, hand	4,166.3	4,230.6	4,435.7	4,614.8	1.5	6.5	10.8
Helpers, construction trades	442.7	449.1	469.7	485.9	1.4	6.1	9.8
Helpers, extractive workers	29.1	29.9	31.2	32.2	2.5	7.1	10.6
Machine feeders and off bearers	277.9	281.2	295.9	308.6	1.2	6.5	11.1
Refuse collectors	98.7	112.3	116.1	120.4	13.7	17.6	22.0
Hand packers and packagers	324.8	327.4	343.6	357.6	.8	5.8	10.1
Vehicle washers and equipment cleaners	143.8	145.3	152.9	159.5	1.0	6.3	10.9
All other helpers, laborers, and material movers, hand	2,849.3	2,885.4	3,026.2	3,150.5	1.3	6.2	10.6

[1] Wage and salary workers only.

Appendix C. Detailed Data on Gross Separations and Age Distributions

This appendix presents data for detailed occupations that supplement information presented in chapter 3. Table C-1 provides gross separation rates; table C-2 contains age distribution data. The tables also identify the occupations in the Current Population Survey (CPS) that are equivalent to those in the Occupational Employment Statistics (OES) surveys.

Table C-1. Separation rates for selected occupations with 100,000 or more employees, 1983-84

(Percent)

Occupation	Separation rates, 1983-84[1]				
	Total	Transfers to other occupations	Not working		
			Total	Unemployed	Not in the labor force
Total employed in 1983, age 16 and over	17.8	8.0	9.8	2.8	7.0
Executive, administrative, and managerial	11.7	6.0	5.6	1.4	4.2
Officials and administrators, public administration	14.3	6.0	8.3	1.7	6.6
Administrators and officials, public administration	14.2	6.0	8.2	1.8	6.4
Executives, officials, and managers, except public administration	11.2	5.7	5.6	1.5	4.1
Financial managers	8.6	3.8	4.7	1.4	3.3
Personnel and labor relations managers	7.5	4.2	3.3	1.6	1.7
Managers; marketing, advertising, and public relations	11.6	7.1	4.6	1.8	2.8
Administrators, education and related fields	10.6	6.1	4.6	.8	3.8
Managers, medicine and health	15.6	13.1	2.5	.0	2.5
Managers and administrators, n.e.c.	11.1	5.7	5.4	1.5	3.9
Management-related occupations	12.3	6.8	5.5	1.3	4.2
Accountants and auditors	9.9	5.7	4.1	1.2	2.9
Other financial officers	14.0	9.2	4.8	.9	3.9
Management analysts	19.6	8.8	10.8	1.0	9.8
Personnel, training, and labor relations specialists	14.8	8.6	6.2	1.5	4.7
Buyers, wholesale and retail trade, except farm products[2]	13.9	7.1	6.7	1.5	5.2
Purchasing agents and buyers, n.e.c.[2]	12.3	3.8	8.5	3.6	4.9
Management-related occupations, n.e.c.	8.8	3.6	5.2	.5	4.7
Professional specialty occupations	10.7	4.9	5.8	1.1	4.7
Engineers, architects, and surveyors	8.7	4.5	4.2	1.1	3.1
Architects	6.0	1.8	4.1	.4	3.7
Engineers	8.6	4.4	4.2	1.2	3.0
Civil engineers[2]	5.0	2.7	2.2	.9	1.3
Electrical and electronics engineers[2]	5.2	2.6	2.5	.5	2.0
Industrial engineers[2]	[3] 15.4	9.4	5.9	1.7	4.2
Mechanical engineers[2]	8.5	1.8	6.7	1.9	4.8
Engineers, n.e.c.	11.3	6.6	4.7	1.3	3.4
Mathematical and computer scientists	9.1	6.6	2.5	1.1	1.4
Computer systems analysts and scientists[2]	9.1	7.7	1.4	.4	1.0
Operations and systems researchers and analysts	4.9	2.0	3.0	1.1	1.9
Natural scientists	7.2	3.4	3.8	.9	2.9
Chemists, except biochemists[2]	6.3	4.4	1.9	.0	1.9
Health diagnosing occupations	2.7	.6	2.0	.1	1.9
Physicians[2]	2.7	.5	2.3	.1	2.2
Dentists[2]	3.8	1.7	2.1	.5	1.6
Health assessment and treating occupations	8.9	2.7	6.3	1.3	5.0
Registered nurses[2]	9.0	2.1	6.9	1.2	5.7
Pharmacists[2]	2.9	.0	2.9	.0	2.9
Therapists	10.2	6.2	4.0	2.0	2.0
Teachers, college and university	16.9	9.8	7.0	1.4	5.6
Postsecondary teachers, subject not specified	17.2	12.2	5.1	1.3	3.8
Teachers, except college and university	11.6	5.1	6.5	.7	5.8
Teachers, prekindergarten and kindergarten	14.9	5.1	9.8	.6	9.2
Teachers, elementary school	9.2	4.0	5.1	.4	4.7
Teachers, secondary school[2]	9.1	4.6	4.6	.7	3.9
Teachers, special education	5.9	2.3	3.6	.4	3.2
Counselors, educational and vocational[2]	12.1	7.6	4.4	.5	3.9
Librarians, archivists, and curators	9.4	5.0	4.4	.4	4.0
Librarians	9.3	5.2	4.2	.3	3.9
Social scientists and urban planners	9.7	4.8	4.8	1.4	3.4
Economists	8.1	3.9	4.2	1.1	3.1
Psychologists	8.5	3.7	4.8	1.2	3.6
Social, recreation, and religious workers	11.5	5.0	6.5	1.5	5.0
Social workers	10.6	4.5	6.0	1.9	4.1
Clergy	6.3	2.4	3.9	.9	3.0
Lawyers and judges	5.7	3.0	2.6	.2	2.4
Lawyers	4.9	2.4	2.5	.3	2.2
Writers, artists, entertainers, and athletes	17.9	7.9	10.0	2.8	7.2
Designers	15.4	7.8	7.6	1.2	6.4
Musicians and composers	22.0	5.8	16.2	7.5	8.7

See footnotes at end of table.

Table C-1. Continued—Separation rates for selected occupations with 100,000 or more employees, 1983-84

(Percent)

Occupation	Separation rates, 1983-84[1]				
	Total	Transfers to other occupations	Not working		
			Total	Unemployed	Not in the labor force
Painters, sculptors, craft-artists, and artist printmakers	15.2	7.1	8.1	1.6	6.5
Photographers	14.9	7.5	7.4	3.1	4.3
Editors and reporters	11.5	3.2	8.3	1.9	6.4
Public relations specialists[2]	18.2	8.7	9.5	1.5	8.0
Technicians and related support	12.6	6.1	6.5	2.2	4.3
Health technologists and technicians	10.5	3.3	7.2	1.8	5.4
Clinical laboratory technologists and technicians	8.5	2.4	6.1	1.6	4.5
Radiologic technicians	8.5	4.6	3.9	.5	3.4
Licensed practical nurses[2]	12.3	3.8	8.5	1.8	6.7
Health technologists and technicians, n.e.c.	11.1	3.3	7.7	2.7	5.0
Technologists and technicians, except health	13.8	7.7	6.1	2.4	3.7
Engineering and related technologists and technicians	13.7	6.2	7.5	3.4	4.1
Electrical and electronics technicians[2]	7.9	3.3	4.6	1.5	3.1
Engineering technicians, n.e.c.	[3] 18.0	5.9	12.1	5.8	6.3
Drafting occupations	16.0	8.7	7.3	3.5	3.8
Science technicians	15.6	9.6	6.0	2.4	3.6
Technicians, except health, engineering, and science	13.6	8.9	4.7	1.4	3.3
Computer programmers	8.9	4.8	4.1	1.8	2.3
Legal assistants	17.6	12.2	5.4	1.0	4.4
Technicians, n.e.c.	16.4	11.5	4.9	1.2	3.7
Sales occupations	19.8	9.5	10.3	2.5	7.8
Supervisors and proprietors, sales occupations	11.1	5.6	5.5	1.3	4.2
Sales representatives, finance and business services	13.6	7.1	6.5	1.6	4.9
Insurance sales occupations[2]	10.4	4.1	6.4	1.9	4.5
Real estate sales occupations	18.1	11.7	6.4	1.1	5.3
Securities and financial services sales occupations[2]	7.5	2.2	5.3	.7	4.6
Advertising and related sales occupations	12.6	4.8	7.8	3.4	4.4
Sales occupations, other business services	15.5	8.4	7.1	2.3	4.8
Sales representatives, commodities except retail	12.3	7.9	4.4	1.5	2.9
Sales representatives; mining, manufacturing, and wholesale	12.7	8.2	4.5	1.5	3.0
Sales workers, retail and personal services	28.9	12.9	16.0	3.8	12.2
Sales workers, motor vehicles and boats	17.8	10.9	6.9	3.1	3.8
Sales workers, apparel	32.6	14.2	18.3	4.1	14.2
Sales workers, shoes	23.4	5.7	17.8	3.0	14.8
Sales workers, furniture and home furnishings	19.2	10.1	9.2	2.5	6.7
Sales workers; radio, television, hi-fi, and appliances	25.3	18.0	7.4	3.1	4.3
Sales workers, hardware and building supplies	19.2	9.0	10.3	5.5	4.8
Sales workers, parts	19.8	14.8	5.0	1.4	3.6
Sales workers, other commodities	27.9	13.2	14.8	3.1	11.7
Sales counter clerks	26.5	13.3	13.2	2.3	10.9
Cashiers[2]	30.4	13.8	16.6	4.2	12.4
Street and door-to-door sales workers	39.1	9.6	29.5	5.3	24.2
News vendors	45.2	8.2	37.0	7.9	29.1
Administrative support, including clerical	19.3	9.2	10.1	2.4	7.7
Supervisors, administrative support occupations	12.9	7.6	5.3	1.3	4.0
Supervisors, general office	[3] 15.1	9.5	5.6	1.1	4.5
Supervisors; distribution, scheduling, and adjusting clerks	12.5	6.7	5.8	2.2	3.6
Computer equipment operators	19.3	13.8	5.5	2.6	2.9
Computer operators[2]	18.4	12.8	5.6	2.6	3.0
Secretaries, stenographers, and typists	16.8	7.2	9.6	2.1	7.5
Secretaries	15.5	6.6	8.9	2.0	6.9
Typists	23.2	10.7	12.5	2.7	9.8
Information clerks	27.3	11.6	15.7	3.8	11.9
Interviewers	32.6	21.2	11.5	3.5	8.0
Receptionists	26.5	12.3	14.2	3.7	10.5
Information clerks, n.e.c.	34.3	7.8	26.5	4.9	21.6
Records processing occupations, except financial	23.0	9.7	13.3	3.1	10.2
Order clerks	[3] 20.8	13.4	7.4	.5	6.9
Library clerks[2]	29.0	12.0	17.0	2.7	14.3
File clerks[2]	25.9	6.6	19.4	5.7	13.7
Records clerks	[3] 20.4	9.9	10.4	2.1	8.3
Financial records processing occupations	19.0	7.2	11.8	2.2	9.6

See footnotes at end of table.

Table C-1. Continued—Separation rates for selected occupations with 100,000 or more employees, 1983-84

(Percent)

Occupation	Separation rates, 1983-84[1]				
	Total	Transfers to other occupations	Not working		
			Total	Unemployed	Not in the labor force
Bookkeepers, accounting and auditing clerks[2]	18.9	6.8	12.1	1.9	10.2
Payroll and timekeeping clerks[2]	[3] 17.6	7.3	10.3	4.8	5.5
Billing clerks	[3] 21.4	12.0	9.4	1.1	8.3
Communications equipment operators	20.1	10.9	9.2	1.9	7.3
Telephone operators	20.4	11.3	9.1	1.7	7.4
Mail and message distributing occupations	15.5	5.7	9.8	1.5	8.3
Postal clerks, except mail carriers	7.7	3.2	4.5	.2	4.3
Mail carriers, postal service	[3] 10.1	1.5	8.6	1.3	7.3
Mail clerks, except postal service[2]	25.1	16.7	8.5	2.3	6.2
Messengers[2]	33.7	3.7	30.0	4.2	25.8
Material recording, scheduling and distribution clerks, n.e.c.	21.9	13.3	8.6	3.1	5.5
Dispatchers	19.6	13.9	5.6	1.5	4.1
Stock and inventory clerks	25.6	14.5	11.0	4.5	6.5
Expediters	21.4	9.5	11.9	1.7	10.2
Adjusters and investigators	15.0	9.0	5.9	2.4	3.5
Insurance adjusters, examiners, and investigators	9.8	6.5	3.3	2.5	.8
Investigators and adjusters, except insurance	15.6	10.7	4.9	1.2	3.7
Miscellaneous administrative support occupations	21.9	11.8	10.2	2.2	8.0
General office clerks	25.3	12.5	12.8	3.5	9.3
Bank tellers[2]	22.3	13.0	9.3	1.2	8.1
Data entry keyers	18.4	11.6	6.8	2.9	3.9
Teacher aides	22.3	10.7	11.7	1.9	9.8
Administrative support occupations, n.e.c.	18.7	10.9	7.8	1.3	6.5
Private household occupations	39.7	5.1	34.6	6.1	28.5
Childcare workers, private household[2]	61.7	6.0	55.7	11.1	44.6
Private household cleaners and servants	28.6	4.7	23.9	3.3	20.6
Service workers, except private household	24.8	9.6	15.3	3.7	11.6
Protective service occupations	13.5	6.1	7.3	2.0	5.3
Supervisors, protective service occupations	7.6	1.7	5.9	.4	5.5
Firefighting and fire prevention occupations	3.8	1.6	2.2	.5	1.7
Firefighting occupations[2]	3.8	1.5	2.3	.5	1.8
Police and detectives	8.6	5.6	3.0	.7	2.3
Police and detectives, public service	5.8	3.2	2.6	.9	1.7
Correctional institution officers[2]	15.7	12.6	3.2	.3	2.9
Guards	23.1	8.8	14.3	4.5	9.8
Guards and police, except public service	22.0	9.0	13.0	4.5	8.5
Food preparation and service occupations	31.5	13.9	17.6	4.6	13.0
Supervisors, food preparation and service occupations	24.2	13.4	10.9	3.5	7.4
Bartenders[2]	32.2	16.9	15.3	7.1	8.2
Waiters and waitresses[2]	32.5	14.8	17.8	3.9	13.9
Cooks, except short order	26.2	11.3	15.0	4.3	10.7
Food counter, fountain, and related occupations	43.3	19.2	24.1	5.1	19.0
Kitchen workers, food preparation	31.5	15.6	15.9	4.5	11.4
Waiters/waitresses assistants[2]	43.2	16.8	26.4	5.5	20.9
Miscellaneous food preparation occupations	32.2	13.2	19.0	5.6	13.4
Health service occupations	20.8	7.1	13.8	3.6	10.2
Dental assistants[2]	16.4	3.0	13.4	2.0	11.4
Health aides, except nursing	19.5	7.8	11.6	3.4	8.2
Nursing aides, orderlies, and attendants	21.7	7.3	14.3	3.8	10.5
Cleaning and building service occupations, except private household	22.8	7.9	14.9	4.2	10.7
Supervisors, cleaning and building service workers	17.9	11.1	6.7	1.6	5.1
Maids and housemen	22.7	8.0	14.7	4.0	10.7
Janitors and cleaners	23.4	7.7	15.8	4.6	11.2
Personal service occupations	25.3	6.5	18.8	2.1	16.7
Hairdressers and cosmetologists	10.3	1.0	9.2	1.2	8.0
Attendants, amusement and recreation facilities[2]	41.5	16.4	25.1	5.3	19.8
Childcare workers, except private household[2]	35.9	7.0	28.9	1.9	27.0
Personal service occupations, n.e.c.	31.6	10.4	21.1	3.9	17.2
Farming, forestry, and fishing	21.5	5.2	16.3	3.0	13.3
Farm operators and managers	[3] 13.4	2.8	10.5	.5	10.0
Farmers, except horticultural	[3] 13.4	2.5	10.8	.4	10.4
Farm occupations, except managerial	28.5	6.1	22.3	5.0	17.3

See footnotes at end of table.

Table C-1. Continued—Separation rates for selected occupations with 100,000 or more employees, 1983-84

(Percent)

Occupation	Separation rates, 1983-84[1]				
	Total	Transfers to other occupations	Not working		
			Total	Unemployed	Not in the labor force
Farm workers	29.1	6.3	22.7	5.2	17.5
Related agricultural occupations	29.1	7.4	21.7	5.3	16.4
Supervisors, related agricultural occupations	15.0	4.1	10.9	3.4	7.5
Groundskeepers and gardeners, except farm[2]	30.8	7.6	23.2	5.7	17.5
Forestry and logging occupations	27.8	11.8	16.0	8.0	8.0
Precision production, craft, and repair	14.9	7.0	7.9	3.4	4.5
Mechanics and repairers	13.2	7.2	5.9	2.2	3.7
Supervisors, mechanics and repairers	10.4	5.9	4.5	1.0	3.5
Mechanics and repairers, except supervisors	13.4	7.3	6.0	2.3	3.7
Vehicle and mobile equipment mechanics and repairers	15.0	8.5	6.5	3.0	3.5
Automobile mechanics	13.8	8.6	5.2	2.8	2.4
Bus, truck, and stationary engine mechanics[2]	14.4	9.7	4.7	3.1	1.6
Automobile body and related repairers[2]	13.5	5.1	8.4	3.5	4.9
Industrial machinery repairers	13.3	7.8	5.4	1.5	3.9
Electrical and electronic equipment repairers	10.6	4.6	5.9	1.4	4.5
Electronics repairers, commercial and industrial equipment	[3] 15.7	8.7	7.0	2.2	4.8
Data processing equipment repairers[2]	11.5	8.2	3.3	1.5	1.8
Telephone installers and repairers[2]	[3] 7.4	.9	6.5	.9	5.6
Heating, air-conditioning, and refrigeration mechanics[2]	8.8	4.1	4.7	3.1	1.6
Miscellaneous mechanics and repairers	12.9	7.0	5.8	2.1	3.7
Specified mechanics and repairers, n.e.c.	12.6	7.5	5.0	1.7	3.3
Not specified mechanics and repairers	18.6	10.6	7.9	2.7	5.2
Construction trades	16.8	6.9	9.9	5.1	4.8
Supervisors, construction occupations	15.3	7.9	7.3	4.1	3.2
Supervisors, n.e.c.	16.5	8.4	8.0	4.4	3.6
Construction trades, except supervisors	17.0	6.7	10.3	5.3	5.0
Brickmasons and stonemasons	13.9	6.4	7.5	4.4	3.1
Carpenters	18.8	7.6	11.3	5.7	5.6
Drywall installers[2]	12.1	.5	11.7	10.6	1.1
Electricians	12.0	5.1	6.9	3.0	3.9
Painters, construction and maintenance	23.6	6.3	17.4	8.1	9.3
Plumbers, pipefitters, and steamfitters	12.1	4.3	7.8	5.0	2.8
Roofers[2]	25.6	12.3	13.2	5.5	7.7
Construction trades, n.e.c.	26.9	14.3	12.6	5.6	7.0
Extractive occupations	29.3	18.6	10.6	7.4	3.2
Precision production occupations	14.1	6.3	7.8	2.7	5.1
Supervisors, production occupations	10.6	6.3	4.2	1.8	2.4
Precision metalworking occupations	13.9	6.4	7.5	3.2	4.3
Tool-and-die makers	6.4	1.2	5.1	2.6	2.5
Machinists	14.6	8.0	6.6	2.2	4.4
Sheet-metal workers	[3] 18.3	7.8	10.5	7.0	3.5
Precision woodworking occupations	17.9	9.6	8.4	2.8	5.6
Precision textile, apparel, and furnishings machine workers	24.4	3.8	20.7	2.1	18.6
Dressmakers	[3] 35.8	7.2	28.6	2.2	26.4
Precision workers, assorted materials	15.4	8.4	7.0	2.6	4.4
Electrical and electronic equipment assemblers	15.2	6.3	8.9	3.3	5.6
Precision food production occupations	[3] 20.0	6.0	14.0	5.6	8.4
Bakers	14.5	.0	14.6	4.5	10.1
Precision inspectors, testers, and related workers	13.6	5.9	7.6	3.2	4.4
Inspectors, testers, and graders	14.0	6.3	7.7	3.0	4.7
Plant and system operators	11.9	5.0	6.9	2.0	4.9
Stationary engineers	[3] 14.1	5.9	8.3	2.9	5.4
Machine operators, assemblers, and inspectors	19.5	9.6	10.0	4.2	5.8
Machine operators and tenders, except precision	19.2	9.1	10.0	4.1	5.9
Metalworking and plastic-working machine operators	18.7	10.3	8.3	3.7	4.6
Punching and stamping press machine operators	18.8	12.1	6.8	4.6	2.2
Grinding, abrading, buffing, and polishing machine operators	19.4	8.3	11.0	3.0	8.0
Metal and plastic processing machine operators	21.2	12.7	8.6	3.5	5.1
Woodworking machine operators	24.8	15.7	9.0	4.3	4.7
Printing machine operators	14.0	8.9	5.0	1.6	3.4
Printing machine operators	[3] 13.4	8.6	4.9	1.6	3.3
Textile, apparel, and furnishings machine operators	20.2	5.8	14.4	5.3	9.1
Textile sewing machine operators	18.0	3.4	14.7	5.5	9.2
Pressing machine operators[2]	16.0	3.4	12.6	4.2	8.4

See footnotes at end of table.

Table C-1. Continued—Separation rates for selected occupations with 100,000 or more employees, 1983-84

(Percent)

Occupation	Separation rates, 1983-84[1]				
	Total	Transfers to other occupations	Not working		
			Total	Unemployed	Not in the labor force
Laundering and drycleaning machine operators	25.5	10.5	14.9	3.1	11.8
Machine operators, assorted materials	19.3	10.4	8.9	4.0	4.9
Packaging and filling machine operators	19.3	8.0	11.4	4.6	6.8
Mixing and blending machine operators	[3] 15.5	8.3	7.2	4.0	3.2
Painting and paint spraying machine operators	19.6	11.1	8.4	4.9	3.5
Furnace, kiln, and oven operators, except food	14.8	5.7	9.0	2.8	6.2
Slicing and cutting machine operators	20.3	11.3	9.1	3.8	5.3
Miscellaneous machine operators, n.e.c.	17.6	9.4	8.1	4.2	3.9
Fabricators, assemblers, and handworking occupations	21.2	10.3	10.9	4.8	6.1
Welders and cutters	19.8	10.1	9.7	6.1	3.6
Assemblers	20.1	9.7	10.4	4.3	6.1
Production inspectors, testers, samplers, and weighers	18.6	10.7	7.8	3.1	4.7
Production inspectors, checkers, and examiners	16.2	9.3	6.9	2.9	4.0
Transportation and material moving occupations	18.7	10.4	8.3	3.6	4.7
Motor vehicle operators	18.4	9.5	8.8	3.5	5.3
Truckdrivers, heavy	16.5	8.5	8.0	4.0	4.0
Truckdrivers, light	26.6	15.5	11.2	3.9	7.3
Driver-sales workers	12.9	7.1	5.8	1.3	4.5
Busdrivers	17.6	9.6	8.0	2.4	5.6
Taxicab drivers and chauffeurs[2]	26.5	7.4	19.2	4.0	15.2
Transportation occupations, except motor vehicle	13.0	7.3	5.6	2.1	3.5
Rail transportation occupations	14.4	9.5	5.0	2.0	3.0
Material moving equipment operators	20.9	13.5	7.4	4.1	3.3
Operating engineers	18.0	9.3	8.7	6.1	2.6
Grader, dozer, and scraper operators	14.9	5.8	9.2	5.1	4.1
Handlers, equipment cleaners, helpers, and laborers	28.2	13.3	14.9	6.6	8.3
Helpers, construction and extractive occupations	37.9	17.5	20.4	9.1	11.3
Helpers, construction trades	37.4	15.8	21.6	9.4	12.2
Construction laborers	28.3	11.4	16.9	9.8	7.1
Freight, stock, and material movers, hand	28.5	14.8	13.7	5.5	8.2
Stock handlers and baggers	33.2	18.6	14.6	4.5	10.1
Freight, stock, and material movers, hand, n.e.c.	21.5	9.9	11.6	6.4	5.2
Garage and service station related occupations[2]	38.7	17.6	21.1	8.1	13.0
Vehicle washers and equipment cleaners[2]	30.7	13.3	17.4	7.7	9.7
Hand packers and packagers	21.0	5.2	15.8	5.8	10.0
Laborers, except construction	25.5	12.8	12.7	5.6	7.1

[1] The occupational separation rate is the percentage of individuals previously employed in an occupation who are not employed in that same occupation a year later. Occupational transfers occur if individuals remain employed, but in a different occupation. Separations exclude deaths.

[2] This Current Population Survey occupation is equivalent to the Occupatonal Employment Statistics survey occupation with the same title.

[3] During 1983-84, employment in this occupation declined; some workers who left were not replaced.

n.e.c. = not elsewhere classified.

NOTE: Due to rounding, individual items may not add to totals.

SOURCE: Merged Current Population Survey data. The methodology used to develop the data is presented in "New Occupational Data Improve Replacement Estimates," *Monthly Labor Review*, March 1984.

Table C-2. Age distribution for selected occupations with 100,000 or more employees, 1984

(Percent)

Occupation	Total	Percent of employees										
		Age 16-24			Age 25-54					Age 55 and older		
		Total	16-19	20-24	Total	25-34	35-44	45-49	50-54	Total	55-64	65 and older
Total employed in 1983, age 16 and over	100.0	19.7	6.2	13.5	66.7	28.8	22.4	8.1	7.3	13.6	10.9	2.7
Executive, administrative, and managerial	100.0	7.5	.6	6.9	76.6	28.2	28.7	10.4	9.3	15.9	13.0	2.9
Officials and administrators, public administration	100.0	2.4	.3	2.1	75.8	20.8	31.7	11.6	11.6	21.8	18.2	3.6
Administrators and officials, public administration	100.0	2.4	.3	2.1	76.8	21.5	32.1	11.7	11.4	20.8	17.6	3.2
Executives, officials, and managers, except public administration	100.0	6.7	.7	6.0	76.8	26.0	29.5	11.3	10.1	16.5	13.5	2.9
Financial managers	100.0	5.6	.0	5.6	84.0	37.5	30.7	8.9	7.0	10.3	9.5	.8
Personnel and labor relations managers	100.0	4.0	.1	3.9	85.1	30.1	36.7	7.4	10.7	11.0	10.6	.4
Managers; marketing, advertising, and public relations	100.0	6.2	.3	5.9	81.8	29.9	32.2	10.3	9.3	12.0	10.7	1.3
Administrators, education and related fields	100.0	2.8	.4	2.4	80.7	17.9	37.6	12.5	12.8	16.5	14.7	1.8
Managers, medicine and health	100.0	3.0	.1	2.8	80.8	29.5	32.8	10.7	7.8	16.3	12.8	3.5
Managers, properties and real estate	100.0	6.4	.2	6.2	64.4	22.4	21.4	9.4	11.1	29.2	17.7	11.5
Managers and administrators, n.e.c.	100.0	7.4	.9	6.5	76.3	25.8	28.9	11.6	10.1	16.3	13.5	2.8
Management-related occupations	100.0	10.1	.4	9.7	76.3	34.9	26.4	7.9	7.0	13.6	10.9	2.8
Accountants and auditors	100.0	13.3	.3	13.0	75.1	39.2	24.0	6.4	5.6	11.6	9.0	2.6
Other financial officers	100.0	7.1	.3	6.8	79.7	33.4	28.9	9.3	8.1	13.2	10.9	2.3
Management analysts	100.0	2.7	.3	2.4	73.7	26.5	28.0	11.7	7.5	23.6	15.8	7.8
Personnel, training, and labor relations specialists	100.0	6.6	.5	6.2	82.2	32.1	34.9	7.8	7.4	11.2	10.4	.8
Buyers, wholesale and retail trade, except farm products[1]	100.0	12.4	.8	11.6	73.5	33.6	24.8	9.5	5.6	14.1	10.3	3.8
Purchasing agents and buyers, n.e.c.[1]	100.0	8.2	.1	8.1	75.5	33.3	24.4	8.3	9.5	16.3	13.9	2.4
Inspectors and compliance officers, except construction	100.0	5.6	.3	5.3	77.2	30.5	27.5	10.5	8.7	17.2	14.0	3.2
Management-related occupations, n.e.c.	100.0	10.1	.3	9.8	77.7	34.7	26.2	8.1	8.7	12.2	10.5	1.7
Professional specialty occupations	100.0	8.1	.8	7.3	79.0	34.0	28.7	8.7	7.6	13.0	10.2	2.7
Engineers, architects, and surveyors	100.0	7.9	.2	7.7	77.5	33.2	26.3	9.2	8.8	14.5	13.0	1.5
Architects	100.0	6.2	.1	6.1	81.6	37.5	34.1	6.3	3.7	12.2	10.1	2.1
Engineers	100.0	7.9	.1	7.8	77.3	32.9	25.[illegible]	9.3	9.2	14.8	13.4	1.5
Civil engineers[1]	100.0	9.0	.1	8.9	76.6	29.5	25.9	11.7	9.4	14.4	13.2	1.2
Electrical and electronics engineers[1]	100.0	7.9	.1	7.8	79.3	33.6	27.5	8.5	9.8	12.8	11.2	1.6
Industrial engineers[1]	100.0	5.6	.3	5.3	80.5	37.1	26.7	8.1	8.6	14.0	12.3	1.7
Mechanical engineers[1]	100.0	7.6	.1	7.6	75.2	31.3	25.2	9.6	9.1	17.2	15.5	1.7
Engineers, n.e.c.	100.0	7.6	.1	7.6	76.2	32.3	26.0	10.1	7.7	16.2	14.5	1.7
Mathematical and computer scientists	100.0	7.6	.2	7.4	85.7	39.3	31.8	8.4	6.2	6.7	5.8	.8
Computer systems analysts and scientists[1]	100.0	8.1	.1	8.0	87.6	41.4	32.0	8.6	5.5	4.4	3.8	.5
Operations and systems researchers and analysts	100.0	5.1	.1	5.0	83.8	35.8	31.0	9.3	7.8	11.0	10.2	.8
Natural scientists	100.0	6.5	.2	6.3	80.2	39.4	26.6	7.1	7.2	13.3	11.1	2.2
Chemists, except biochemists[1]	100.0	7.3	.3	7.0	79.5	40.2	26.0	7.8	5.4	13.2	11.3	1.9
Health diagnosing occupations	100.0	1.4	.1	1.3	75.5	29.5	27.9	9.2	8.8	23.1	16.3	6.8
Physicians[1]	100.0	1.4	.0	1.4	75.8	28.2	29.3	9.9	8.6	22.7	16.2	6.5
Dentists[1]	100.0	1.1	.3	.8	71.7	26.3	24.3	9.8	11.3	27.2	18.7	8.6
Health assessment and treating occupations	100.0	9.8	.3	9.5	80.6	40.7	25.7	7.3	7.0	9.6	8.2	1.4
Registered nurses[1]	100.0	8.5	.1	8.5	81.4	38.5	26.9	8.5	7.6	10.1	9.0	1.1
Pharmacists[1]	100.0	9.2	.5	8.7	76.2	36.9	25.2	5.8	6.4	14.5	10.3	4.2
Therapists	100.0	14.4	.7	13.7	82.5	53.6	21.7	3.3	4.0	3.1	2.4	.7
Teachers, college and university	100.0	6.9	.6	6.3	76.0	25.7	29.7	11.3	9.3	17.1	14.7	2.4
Postsecondary teachers, subject not specified	100.0	11.6	1.5	10.1	75.2	25.9	27.1	12.9	9.3	13.2	11.5	1.7
Teachers, except college and university	100.0	7.3	1.1	6.2	82.5	31.8	33.1	9.6	8.0	10.3	8.4	1.9

See footnotes at end of table.

Table C-2. Continued—Age distribution for selected occupations with 100,000 or more employees, 1984

(Percent)

Occupation	Total	Percent of employees										
		Age 16-24			Age 25-54					Age 55 and older		
		Total	16-19	20-24	Total	25-34	35-44	45-49	50-54	Total	55-64	65 and older
Teachers, prekindergarten and kindergarten	100.0	15.1	2.1	13.1	78.2	33.3	30.9	7.9	6.2	6.6	5.3	1.3
Teachers, elementary school	100.0	4.5	.2	4.2	85.1	30.9	34.7	10.3	9.2	10.4	9.1	1.3
Teachers, secondary school[1]	100.0	4.6	.3	4.3	84.7	30.1	35.8	10.4	8.4	10.7	9.0	1.7
Teachers, special education	100.0	7.3	.5	6.8	85.5	46.5	27.2	6.2	5.6	7.2	5.9	1.4
Teachers, n.e.c.	100.0	18.0	5.8	12.3	69.3	31.5	24.2	8.0	5.7	12.6	7.4	5.2
Counselors, educational and vocational[1]	100.0	7.2	1.0	6.2	77.9	22.6	34.1	11.5	9.7	14.9	13.5	1.4
Librarians, archivists, and curators	100.0	7.0	1.0	6.1	66.7	23.6	24.8	9.9	8.5	26.3	19.7	6.6
Librarians	100.0	7.1	1.0	6.0	66.2	23.3	23.8	10.2	8.9	26.7	20.1	6.6
Social scientists and urban planners	100.0	6.5	.3	6.3	84.2	37.5	33.1	7.9	5.6	9.3	7.5	1.8
Economists	100.0	9.9	.4	9.4	82.6	39.0	31.1	7.8	4.7	7.5	6.4	1.2
Psychologists	100.0	3.6	.1	3.5	87.0	35.9	35.6	8.9	6.6	9.4	6.9	2.5
Social, recreation, and religious workers	100.0	7.7	1.3	6.4	75.6	34.5	24.4	9.2	7.6	16.6	11.1	5.5
Social workers	100.0	6.7	.4	6.4	83.0	41.1	27.7	8.7	5.5	10.3	8.6	1.7
Clergy	100.0	2.3	.1	2.2	70.9	27.8	22.7	10.6	9.7	26.8	15.0	11.8
Lawyers and judges	100.0	2.6	.1	2.5	82.1	34.8	33.2	7.2	7.0	15.3	10.1	5.2
Lawyers	100.0	2.7	.1	2.6	83.5	36.4	33.8	7.0	6.2	13.9	9.1	4.8
Writers, artists, entertainers, and athletes	100.0	14.9	2.5	12.4	73.0	35.8	24.5	7.1	5.7	12.1	8.6	3.5
Designers	100.0	12.8	2.2	10.6	76.0	33.6	27.3	8.5	6.6	11.2	8.3	2.9
Musicians and composers	100.0	15.3	3.1	12.2	70.2	42.5	19.0	4.8	3.9	14.5	7.0	7.5
Painters, sculptors, craft-artists, and artist printmakers	100.0	11.0	1.4	9.7	75.5	34.3	25.6	7.6	8.0	13.5	9.5	4.0
Photographers	100.0	17.7	2.6	15.1	71.5	36.7	24.8	5.4	4.7	10.8	8.9	1.9
Editors and reporters	100.0	12.4	.8	11.6	76.4	41.5	22.9	6.7	5.4	11.2	7.3	4.0
Public relations specialists[1]	100.0	9.8	.3	9.5	75.2	33.5	26.9	10.3	4.5	15.0	10.9	4.1
Technicians and related support	100.0	16.7	1.4	15.4	75.6	40.9	22.6	7.2	4.9	7.6	6.6	1.0
Health technologists and technicians	100.0	15.1	1.0	14.1	76.5	41.6	23.5	6.6	4.9	8.4	7.1	1.2
Clinical laboratory technologists and technicians	100.0	17.2	1.1	16.1	77.6	41.3	27.2	5.7	3.4	5.2	4.4	.8
Radiologic technicians	100.0	20.1	.6	19.5	75.5	42.3	24.8	4.6	3.7	4.4	4.1	.3
Licensed practical nurses[1]	100.0	7.7	.4	7.3	79.3	40.5	23.2	8.6	7.0	13.1	11.1	1.9
Health technologists and technicians, n.e.c.	100.0	22.9	2.3	20.6	70.4	40.8	20.1	5.5	4.0	6.8	5.5	1.3
Technologists and technicians, except health	100.0	17.6	1.6	16.0	75.1	40.5	22.1	7.5	5.0	7.3	6.4	.9
Engineering and related technologists and technicians	100.0	18.1	1.7	16.5	73.5	38.3	20.9	8.2	6.1	8.3	7.6	.8
Electrical and electronics technicians[1]	100.0	15.7	1.6	14.1	78.6	44.7	21.8	7.4	4.7	5.8	5.2	.5
Engineering technicians, n.e.c.	100.0	16.9	1.8	15.1	73.7	30.3	25.2	11.3	7.0	9.4	8.7	.7
Drafting occupations	100.0	20.4	1.5	18.9	69.9	39.0	17.4	6.9	6.6	9.8	8.7	1.0
Science technicians	100.0	21.0	2.5	18.6	71.1	39.2	20.0	7.0	4.9	7.9	7.6	.3
Technicians, except health, engineering, and science	100.0	16.5	1.4	15.2	77.3	42.7	23.7	7.0	3.9	6.2	5.1	1.1
Computer programmers	100.0	19.7	1.7	18.1	77.6	47.7	22.3	5.1	2.4	2.7	2.6	.1
Legal assistants	100.0	13.4	.5	12.9	77.9	38.4	27.0	8.7	3.8	8.7	6.0	2.7
Technicians, n.e.c.	100.0	16.6	1.4	15.2	74.3	41.6	22.1	6.2	4.4	9.0	7.2	1.8
Sales occupations	100.0	24.9	9.9	14.9	60.5	25.1	20.5	7.5	7.0	14.6	11.1	3.5
Supervisors and proprietors, sales occupations	100.0	11.4	1.2	10.2	72.3	28.2	25.3	9.5	9.3	16.3	12.9	3.4
Sales representatives, finance and business services	100.0	10.5	1.4	9.1	72.2	27.6	27.0	9.3	8.3	17.3	12.8	4.6
Insurance sales occupations[1]	100.0	7.2	.4	6.7	75.0	29.2	27.4	9.0	9.4	17.8	13.3	4.5
Real estate sales occupations	100.0	4.8	.2	4.6	70.0	18.7	28.4	12.0	10.9	25.2	17.4	7.8
Securities and financial services sales occupations[1]	100.0	12.5	.4	12.1	74.6	31.9	28.2	7.7	6.9	13.0	9.9	3.1
Advertising and related sales occupations	100.0	12.9	1.3	11.6	76.4	39.2	26.2	6.9	4.0	10.7	8.2	2.5
Sales occupations, other business services	100.0	21.0	4.9	16.1	69.2	32.3	24.2	7.3	5.4	9.8	8.3	1.6

See footnotes at end of table.

Table C-2. Continued—Age distribution for selected occupations with 100,000 or more employees, 1984

(Percent)

Occupation	Total	Percent of employees										
		Age 16-24			Age 25-54					Age 55 and older		
		Total	16-19	20-24	Total	25-34	35-44	45-49	50-54	Total	55-64	65 and older
Sales representatives, commodities except retail	100.0	9.9	1.0	8.9	74.5	32.7	26.0	8.8	7.0	15.6	12.2	3.3
Sales representatives; mining, manufacturing, and wholesale	100.0	10.1	1.1	9.0	74.3	32.7	26.0	8.7	6.9	15.6	12.2	3.4
Sales workers, retail and personal services	100.0	41.0	20.0	21.1	46.4	21.4	14.3	5.5	5.2	12.5	9.2	3.3
Sales workers, motor vehicles and boats	100.0	13.8	2.2	11.6	71.7	31.3	22.4	11.1	6.9	14.5	11.9	2.7
Sales workers, apparel	100.0	43.3	20.6	22.7	37.1	14.0	12.3	5.5	5.4	19.6	13.0	6.6
Sales workers, shoes	100.0	57.9	28.7	29.2	32.2	18.0	6.6	4.0	3.5	10.0	6.7	3.2
Sales workers, furniture and home furnishings	100.0	17.3	5.1	12.3	65.8	26.4	22.8	5.7	10.9	16.8	12.7	4.1
Sales workers, radio, television, hi-fi, and appliances	100.0	38.7	11.9	26.8	54.2	29.8	15.2	4.3	5.0	7.0	5.9	1.1
Sales workers, hardware and building supplies	100.0	25.8	9.3	16.5	53.9	28.4	13.2	6.1	6.2	20.4	12.9	7.5
Sales workers, parts	100.0	28.2	6.0	22.3	61.7	36.3	14.9	6.7	3.8	10.0	8.6	1.5
Sales workers, other commodities	100.0	38.9	18.4	20.5	45.1	19.3	14.4	5.5	5.9	16.0	12.1	3.9
Sales counter clerks	100.0	32.7	14.8	17.9	50.7	21.8	16.7	5.9	6.3	16.7	10.8	5.9
Cashiers[1]	100.0	51.8	26.6	25.1	40.2	19.1	12.2	4.7	4.2	8.1	6.1	1.9
Street and door-to-door sales workers	100.0	18.0	7.4	10.6	67.6	32.0	21.9	7.5	6.1	14.4	10.0	4.4
News vendors	100.0	60.1	52.0	8.0	32.9	14.1	11.7	4.2	2.9	7.0	5.6	1.4
Administrative support, including clerical	100.0	21.4	5.0	16.3	65.9	28.9	21.8	7.9	7.3	12.7	10.5	2.2
Supervisors, administrative support occupations	100.0	6.7	.4	6.3	80.4	31.4	27.4	11.9	9.7	12.9	12.2	.7
Supervisors, general office	100.0	6.8	.4	6.4	79.5	30.0	27.3	12.1	10.1	13.7	12.9	.8
Supervisors, distribution, scheduling, and adjusting clerks	100.0	7.6	.5	7.1	78.6	29.0	27.5	11.9	10.1	13.8	13.3	.5
Computer equipment operators	100.0	27.8	4.5	23.4	66.9	35.5	20.8	5.8	4.8	5.3	4.7	.5
Computer operators[1]	100.0	27.9	4.5	23.4	66.9	35.6	20.7	5.8	4.7	5.3	4.7	.5
Secretaries, stenographers, and typists	100.0	21.2	4.8	16.4	66.7	28.5	23.0	8.3	6.9	12.1	10.3	1.8
Secretaries	100.0	19.5	3.8	15.8	68.2	28.5	24.1	8.6	7.1	12.3	10.5	1.7
Typists	100.0	29.8	10.0	19.8	59.2	28.0	18.2	7.0	6.0	11.0	8.9	2.1
Information clerks	100.0	31.1	9.6	21.5	55.8	25.0	18.0	6.5	6.4	13.2	9.7	3.5
Interviewers	100.0	26.9	6.8	20.1	60.9	29.5	18.7	6.7	6.0	12.3	10.5	1.8
Receptionists	100.0	32.7	10.5	22.2	54.6	24.3	16.9	6.3	7.3	12.6	9.4	3.2
Information clerks, n.e.c.	100.0	29.8	12.5	17.3	53.2	22.2	18.1	7.1	5.8	17.0	11.1	5.9
Records processing occupations, except financial	100.0	28.8	10.3	18.5	59.1	27.6	19.6	6.0	5.9	12.1	10.1	1.9
Order clerks	100.0	17.1	3.3	13.9	73.5	35.7	25.3	6.7	5.7	9.4	8.5	.9
Library clerks[1]	100.0	38.1	16.1	22.0	47.1	16.9	18.9	6.4	5.0	14.7	12.5	2.2
File clerks[1]	100.0	40.6	17.4	23.2	48.9	26.1	14.5	3.8	4.4	10.5	8.8	1.7
Records clerks	100.0	18.5	3.5	15.0	64.9	28.2	20.4	7.5	8.7	16.6	12.8	3.8
Financial records processing occupations	100.0	15.3	2.6	12.7	68.1	26.3	23.3	8.9	9.6	16.6	13.2	3.5
Bookkeepers, accounting and auditing clerks[1]	100.0	14.4	2.4	12.0	68.2	25.5	23.5	9.1	10.2	17.4	13.5	3.9
Payroll and timekeeping clerks[1]	100.0	14.1	1.3	12.8	71.1	27.9	24.8	9.6	8.8	14.8	13.0	1.8
Billing clerks	100.0	21.0	4.7	16.3	65.6	30.3	21.9	7.6	5.8	13.4	12.2	1.2
Communications equipment operators	100.0	22.4	5.2	17.2	60.7	23.3	20.0	7.8	9.6	17.0	13.9	3.1
Telephone operators	100.0	22.5	5.3	17.2	60.5	23.1	19.7	7.9	9.7	17.1	13.9	3.2
Mail and message distributing occupations	100.0	18.1	5.7	12.3	66.0	28.5	20.7	8.2	8.6	15.9	12.8	3.1
Postal clerks, except mail carriers	100.0	4.6	.4	4.3	79.9	32.2	27.0	9.3	11.4	15.5	13.3	2.1
Mail carriers, postal service	100.0	3.9	.3	3.6	81.2	31.3	27.0	11.7	11.3	14.8	13.8	1.1
Mail clerks, except postal service[1]	100.0	36.9	9.6	27.2	47.0	23.7	12.1	6.3	4.8	16.2	12.0	4.1
Messengers[1]	100.0	48.5	22.3	26.2	32.8	21.7	6.9	1.5	2.7	18.6	11.0	7.6
Material recording, scheduling and distribution clerks, n.e.c.	100.0	21.1	5.6	15.5	66.7	32.0	20.0	7.4	7.2	12.2	10.6	1.6
Dispatchers	100.0	13.0	1.7	11.2	75.7	35.8	24.2	8.5	7.1	11.4	10.2	1.2
Production coordinators	100.0	12.9	1.1	11.7	76.0	33.7	26.4	8.4	7.5	11.1	10.6	.5
Traffic, shipping, and receiving clerks	100.0	25.3	5.8	19.5	64.2	32.3	19.6	6.1	6.2	10.5	9.3	1.2
Stock and inventory clerks	100.0	24.2	8.2	16.0	62.5	29.6	17.5	7.0	8.4	13.3	11.3	1.9

See footnotes at end of table.

Table C-2. Continued—Age distribution for selected occupations with 100,000 or more employees, 1984

(Percent)

Occupation	Total	Percent of employees										
		Age 16-24			Age 25-54					Age 55 and older		
		Total	16-19	20-24	Total	25-34	35-44	45-49	50-54	Total	55-64	65 and older
Expediters	100.0	19.7	5.9	13.8	66.9	32.1	19.7	7.5	7.6	13.4	11.1	2.3
Adjusters and investigators	100.0	17.7	2.2	15.5	72.0	36.3	21.2	8.2	6.3	10.3	8.7	1.6
Insurance adjusters, examiners, and investigators	100.0	13.0	2.2	10.7	78.4	41.6	23.7	7.2	5.9	8.7	7.4	1.3
Investigators and adjusters, except insurance	100.0	21.5	1.9	19.6	68.7	34.8	18.9	8.5	6.5	9.8	8.1	1.6
Miscellaneous administrative support occupations	100.0	24.1	5.3	18.8	64.1	28.9	21.1	7.3	6.9	11.8	9.7	2.1
General office clerks	100.0	24.9	7.5	17.4	59.5	26.1	17.5	8.0	7.9	15.6	12.3	3.3
Bank tellers[1]	100.0	40.0	8.0	32.0	54.3	27.4	16.9	5.6	4.4	5.7	4.8	1.0
Data entry keyers	100.0	23.5	3.7	19.8	69.1	36.2	22.7	4.7	5.5	7.4	6.9	.6
Teacher aides	100.0	13.7	3.3	10.4	73.6	24.2	30.5	10.5	8.5	12.7	11.2	1.5
Administrative support occupations, n.e.c.	100.0	18.0	3.1	14.9	68.4	30.6	22.9	7.6	7.4	13.6	11.2	2.4
Private household occupations	100.0	31.5	20.6	10.9	40.9	14.1	13.0	6.3	7.6	27.5	17.9	9.6
Childcare workers, private household[1]	100.0	62.7	45.6	17.0	26.7	14.0	7.6	2.5	2.7	10.7	6.3	4.4
Private household cleaners and servants	100.0	11.1	4.5	6.5	51.1	14.4	16.8	8.8	11.1	37.8	25.3	12.5
Service workers, except private household	100.0	31.5	13.9	17.6	54.7	24.1	17.8	6.5	6.3	13.8	10.3	3.5
Protective service occupations	100.0	15.7	3.8	11.9	69.7	30.2	25.7	7.1	6.6	14.6	10.8	3.8
Supervisors, protective service occupations	100.0	2.2	.1	2.2	83.2	19.0	38.7	13.3	12.2	14.6	13.6	.9
Firefighting and fire prevention occupations	100.0	8.9	.3	8.6	85.0	36.0	35.1	7.6	6.4	6.0	5.6	.4
Firefighting occupations[1]	100.0	9.4	.3	9.2	85.8	36.9	36.2	7.3	5.4	4.8	4.8	.0
Police and detectives	100.0	11.8	.7	11.1	81.4	39.8	30.3	6.5	4.8	6.8	5.5	1.3
Police and detectives, public service	100.0	8.7	.4	8.3	87.0	42.2	33.5	7.1	4.3	4.3	4.0	.3
Correctional institution officers[1]	100.0	19.1	1.6	17.4	71.0	34.6	24.8	5.5	6.1	9.9	9.1	.9
Guards	100.0	24.2	8.5	15.7	51.2	21.4	16.1	6.2	7.5	24.7	16.9	7.8
Guards and police, except public service	100.0	20.7	5.3	15.4	54.3	23.0	16.6	6.5	8.1	25.0	17.8	7.2
Food preparation and service occupations	100.0	48.4	25.5	22.8	42.6	20.6	12.3	5.0	4.7	9.1	7.3	1.8
Supervisors, food preparation and service occupations	100.0	35.7	16.8	18.9	52.0	21.8	17.2	5.7	7.2	12.3	9.5	2.9
Bartenders[1]	100.0	25.3	1.9	23.4	65.1	37.7	17.2	6.0	4.3	9.6	7.4	2.2
Waiters and waitresses[1]	100.0	48.2	18.1	30.2	46.2	27.1	11.5	4.1	3.4	5.6	4.7	.9
Cooks, except short order	100.0	42.1	21.1	20.9	45.5	18.1	14.3	6.6	6.5	12.4	10.3	2.2
Food counter, fountain, and related occupations	100.0	83.4	66.3	17.1	14.9	8.1	3.6	1.7	1.5	1.7	1.2	.6
Kitchen workers, food preparation	100.0	51.3	27.2	24.1	37.2	15.0	11.6	6.0	4.7	11.5	8.1	3.4
Waiters/waitresses assistants[1]	100.0	68.3	48.4	19.9	25.4	11.5	7.6	3.1	3.2	6.3	4.7	1.6
Miscellaneous food preparation occupations	100.0	46.3	29.0	17.3	40.5	16.4	13.3	5.3	5.6	13.2	10.5	2.7
Health service occupations	100.0	23.0	5.4	17.6	64.2	27.6	21.4	7.9	7.2	12.8	10.2	2.5
Dental assistants[1]	100.0	39.1	8.5	30.6	56.8	35.3	16.2	3.2	2.1	4.1	3.7	.4
Health aides, except nursing	100.0	27.7	7.1	20.6	63.5	29.5	22.5	5.5	6.0	8.8	6.9	1.9
Nursing aides, orderlies, and attendants	100.0	19.6	4.5	15.0	65.4	26.0	21.9	9.3	8.2	15.1	12.0	3.0
Cleaning and building service occupations, except private household	100.0	22.6	9.0	13.5	56.0	21.8	17.3	8.1	8.9	21.4	16.0	5.5
Supervisors, cleaning and building service workers	100.0	7.0	1.0	6.0	70.3	21.7	22.0	14.6	12.0	22.7	18.5	4.2
Maids and housemen	100.0	20.0	6.6	13.5	63.0	23.5	20.4	9.8	9.2	17.0	13.9	3.0
Janitors and cleaners	100.0	24.5	10.4	14.1	52.9	21.0	16.2	7.2	8.6	22.6	16.3	6.3
Personal service occupations	100.0	22.6	7.4	15.1	62.5	28.2	22.7	6.3	5.4	14.9	9.5	5.4
Barbers[1]	100.0	4.5	.6	4.0	65.6	16.6	26.3	8.1	14.6	29.9	15.6	14.3
Hairdressers and cosmetologists	100.0	21.0	4.3	16.7	66.6	28.9	27.1	5.4	5.2	12.4	8.3	4.1
Attendants, amusement and recreation facilities[1]	100.0	52.8	30.2	22.6	38.2	20.1	12.4	3.6	2.1	9.0	5.7	3.3
Childcare workers, except private household[1]	100.0	21.3	7.2	14.1	63.6	31.3	20.6	7.1	4.6	15.1	9.8	5.3

See footnotes at end of table.

Table C-2. Continued—Age distribution for selected occupations with 100,000 or more employees, 1984

(Percent)

Occupation	Total	Percent of employees										
		Age 16-24			Age 25-54					Age 55 and older		
		Total	16-19	20-24	Total	25-34	35-44	45-49	50-54	Total	55-64	65 and older
Personal service occupations, n.e.c.	100.0	28.8	10.4	18.5	48.4	19.7	15.5	7.3	6.0	22.7	13.4	9.4
Farming, forestry, and fishing	100.0	24.3	11.3	13.1	53.6	22.5	16.6	7.5	7.0	22.1	14.1	8.0
Farm operators and managers	100.0	6.8	1.3	5.5	57.5	19.1	18.6	9.5	10.3	35.8	21.8	14.0
Farmers, except horticultural	100.0	6.3	1.1	5.2	56.6	18.2	18.3	9.6	10.5	37.1	22.5	14.6
Farm occupations, except managerial	100.0	34.9	18.0	16.9	51.9	23.5	16.6	6.9	5.0	13.2	9.2	4.0
Farm workers	100.0	36.0	18.7	17.3	51.4	23.2	16.4	6.9	4.8	12.7	8.7	3.9
Related agricultural occupations	100.0	40.5	20.2	20.3	45.8	24.4	12.5	4.7	4.1	13.8	9.1	4.6
Supervisors, related agricultural occupations	100.0	28.1	7.1	21.0	59.4	31.9	16.2	5.5	5.9	12.5	10.1	2.3
Groundskeepers and gardeners, except farm[1]	100.0	42.7	22.7	20.0	42.5	22.5	11.5	4.5	4.0	14.8	9.6	5.2
Forestry and logging occupations	100.0	17.2	4.6	12.5	73.9	37.5	20.1	8.2	8.0	8.9	8.1	.8
Precision production, craft, and repair	100.0	15.8	3.1	12.7	71.5	32.4	22.8	8.7	7.7	12.7	10.9	1.8
Mechanics and repairers	100.0	15.4	2.9	12.5	72.9	32.4	23.9	8.9	7.8	11.7	10.0	1.6
Supervisors, mechanics and repairers	100.0	2.8	.1	2.7	80.9	22.7	31.0	13.6	13.6	16.3	15.3	1.0
Mechanics and repairers, except supervisors	100.0	16.2	3.1	13.1	72.4	33.0	23.4	8.6	7.4	11.4	9.7	1.7
Vehicle and mobile equipment mechanics and repairers	100.0	20.3	4.4	15.9	70.1	34.7	21.8	7.9	5.8	9.6	8.1	1.6
Automobile mechanics	100.0	24.1	5.1	19.1	67.5	35.1	19.8	7.2	5.3	8.4	6.8	1.6
Bus, truck, and stationary engine mechanics[1]	100.0	15.4	2.4	13.0	74.9	35.7	25.2	7.9	6.1	9.7	8.7	1.0
Automobile body and related repairers[1]	100.0	28.0	7.4	20.6	63.9	32.8	17.6	9.4	4.2	8.1	7.0	1.1
Heavy equipment mechanics	100.0	6.3	1.1	5.2	81.3	38.5	25.8	9.8	7.2	12.4	11.5	1.0
Industrial machinery repairers	100.0	10.3	1.4	8.9	74.9	29.6	24.8	10.9	9.5	14.8	13.6	1.2
Electrical and electronic equipment repairers	100.0	11.7	1.7	10.0	79.3	33.9	29.0	8.3	8.1	9.0	7.8	1.3
Electronics repairers, commercial and industrial equipment	100.0	21.2	4.7	16.6	64.5	31.5	20.6	6.7	5.7	14.2	11.8	2.4
Data processing equipment repairers[1]	100.0	15.2	.6	14.6	80.6	41.5	25.2	8.3	5.7	4.2	3.6	.6
Telephone installers and repairers[1]	100.0	5.7	.5	5.2	87.1	31.8	35.3	9.1	10.9	7.3	7.1	.2
Heating, air-conditioning, and refrigeration mechanics[1]	100.0	17.8	3.0	14.8	72.1	34.2	23.2	8.0	6.7	10.1	8.0	2.1
Miscellaneous mechanics and repairers	100.0	14.6	2.6	12.0	70.3	30.6	21.8	9.1	8.9	15.0	12.5	2.5
Specified mechanics and repairers, n.e.c.	100.0	18.0	3.3	14.7	67.1	31.2	19.7	8.6	7.6	14.9	12.4	2.4
Not specified mechanics and repairers	100.0	12.7	1.9	10.8	70.7	31.4	19.3	10.0	10.0	16.6	13.8	2.8
Construction trades	100.0	18.8	4.0	14.8	70.0	34.8	21.0	7.4	6.8	11.2	9.7	1.5
Supervisors, construction occupations	100.0	5.3	.3	5.0	78.1	30.1	26.0	10.9	11.1	16.6	15.0	1.6
Supervisors, n.e.c.	100.0	5.4	.2	5.1	78.1	30.7	24.9	11.4	11.1	16.5	14.8	1.7
Construction trades, except supervisors	100.0	20.6	4.5	16.1	68.9	35.4	20.3	7.0	6.2	10.5	8.9	1.5
Brickmasons and stonemasons	100.0	16.4	4.0	12.3	68.9	26.7	21.4	11.0	9.9	14.7	13.5	1.2
Carpenters	100.0	20.9	4.3	16.7	67.9	37.3	19.1	6.5	5.0	11.1	9.1	2.1
Drywall installers[1]	100.0	31.5	7.1	24.4	64.7	34.5	18.6	7.4	4.2	3.8	3.2	.6
Electricians	100.0	12.0	1.3	10.7	76.2	35.3	26.3	7.9	6.6	11.8	10.5	1.3
Electrical power installers and repairers	100.0	11.1	1.2	9.9	80.8	34.4	32.5	7.4	6.5	8.1	8.0	.1
Painters, construction and maintenance	100.0	24.9	7.8	17.1	63.3	31.9	18.2	6.6	6.5	11.9	9.3	2.6
Plumbers, pipefitters, and steamfitters	100.0	14.0	1.7	12.2	73.2	36.2	21.5	7.7	7.8	12.8	11.3	1.5
Roofers[1]	100.0	32.0	7.7	24.3	63.0	37.9	15.1	4.9	5.1	5.0	4.4	.5
Construction trades, n.e.c.	100.0	29.2	9.3	19.9	62.2	31.6	17.8	5.7	7.2	8.6	8.0	.6
Extractive occupations	100.0	17.7	2.2	15.5	73.9	37.5	20.0	8.7	7.8	8.4	7.9	.5
Precision production occupations	100.0	12.7	2.3	10.4	71.7	29.2	23.7	9.9	8.8	15.7	13.4	2.2
Supervisors, production occupations	100.0	5.9	.4	5.5	78.1	26.7	28.2	12.0	11.1	16.0	14.7	1.3
Precision metalworking occupations	100.0	13.4	2.0	11.4	71.2	33.3	21.0	9.1	7.8	15.4	13.5	1.9

See footnotes at end of table.

Table C-2. Continued—Age distribution for selected occupations with 100,000 or more employees, 1984

(Percent)

Occupation	Total	Percent of employees										
		Age 16-24			Age 25-54					Age 55 and older		
		Total	16-19	20-24	Total	25-34	35-44	45-49	50-54	Total	55-64	65 and older
Tool-and-die makers	100.0	10.0	1.0	9.0	71.8	25.5	19.6	11.5	15.3	18.2	15.0	3.2
Machinists	100.0	13.2	1.9	11.4	72.7	36.3	21.3	8.9	6.3	14.0	12.6	1.4
Sheet-metal workers	100.0	14.4	3.4	11.1	72.1	31.4	21.5	11.6	7.5	13.5	13.2	.3
Precision woodworking occupations	100.0	21.2	5.2	16.1	64.1	28.3	19.9	6.8	9.2	14.7	11.0	3.7
Precision textile, apparel, and furnishings machine workers	100.0	12.7	3.6	9.2	57.5	21.2	19.2	9.2	7.9	29.7	19.2	10.5
Dressmakers	100.0	7.4	2.2	5.2	53.6	18.4	17.8	8.5	8.9	39.0	27.8	11.2
Precision workers, assorted materials	100.0	21.1	4.5	16.7	68.5	30.7	23.4	8.3	6.1	10.4	9.2	1.1
Electrical and electronic equipment assemblers	100.0	22.8	5.2	17.6	66.9	29.4	24.4	7.8	5.2	10.3	9.8	.5
Precision food production occupations	100.0	24.3	5.6	18.7	63.1	26.7	20.2	9.0	7.2	12.7	9.8	2.8
Butchers and meat cutters	100.0	23.6	4.1	19.5	62.1	26.2	21.6	8.4	5.9	14.4	10.9	3.5
Bakers	100.0	24.9	7.9	17.0	65.9	28.5	15.9	10.6	11.0	9.2	7.8	1.5
Precision inspectors, testers, and related workers	100.0	10.6	1.5	9.1	71.6	30.1	21.2	10.2	10.1	17.8	17.5	.3
Inspectors, testers, and graders	100.0	11.6	1.7	10.0	71.4	28.6	22.3	10.5	10.0	16.9	16.7	.2
Plant and system operators	100.0	5.0	.2	4.8	78.9	36.7	24.5	9.1	8.6	16.2	14.9	1.3
Stationary engineers	100.0	4.7	.3	4.4	73.2	26.8	25.9	9.5	11.0	22.1	19.5	2.6
Machine operators, assemblers, and inspectors	100.0	18.7	4.1	14.6	68.6	30.1	22.6	8.4	7.4	12.7	11.2	1.5
Machine operators and tenders, except precision	100.0	19.3	4.3	15.0	67.6	29.7	22.2	8.4	7.3	13.0	11.4	1.6
Metalworking and plastic-working machine operators	100.0	16.0	3.2	12.9	71.3	30.7	23.1	9.2	8.3	12.7	11.4	1.2
Punching and stamping press machine operators	100.0	18.1	2.4	15.8	70.0	31.1	21.7	7.7	9.5	11.9	11.1	.7
Grinding, abrading, buffing, and polishing machine operators	100.0	18.0	4.3	13.7	68.9	28.1	25.5	8.9	6.4	13.1	11.4	1.7
Metal and plastic processing machine operators	100.0	19.0	3.5	15.5	68.5	32.4	25.2	5.7	5.3	12.5	10.7	1.8
Molding and casting machine operators	100.0	19.8	3.7	16.1	68.2	33.4	23.6	6.5	4.7	12.0	10.4	1.6
Woodworking machine operators	100.0	24.5	6.3	18.2	66.7	33.8	18.0	7.2	7.6	8.8	7.9	1.0
Printing machine operators	100.0	23.4	5.4	18.1	64.1	29.7	20.7	7.1	6.6	12.4	10.8	1.6
Printing machine operators	100.0	24.0	5.6	18.4	63.4	29.8	20.6	7.5	5.5	12.6	11.0	1.7
Textile, apparel, and furnishings machine operators	100.0	16.0	3.8	12.2	68.2	27.7	22.4	9.6	8.5	15.8	13.3	2.5
Textile sewing machine operators	100.0	13.5	3.0	10.5	70.4	28.9	23.7	9.8	8.0	16.0	13.5	2.6
Pressing machine operators[1]	100.0	18.0	3.9	14.1	64.0	24.2	22.4	8.2	9.3	17.9	15.5	2.4
Laundering and drycleaning machine operators	100.0	23.1	5.4	17.7	59.5	22.4	17.7	10.1	9.2	17.4	12.8	4.7
Machine operators, assorted materials	100.0	20.7	4.4	16.2	67.3	30.1	22.3	8.1	6.7	12.1	10.8	1.3
Packaging and filling machine operators	100.0	23.4	6.6	16.8	63.2	29.9	20.2	7.5	5.6	13.4	12.0	1.4
Mixing and blending machine operators	100.0	22.5	2.6	19.8	64.6	28.9	20.9	7.8	7.0	13.0	11.0	1.9
Painting and paint spraying machine operators	100.0	24.0	5.6	18.3	67.2	32.4	20.5	8.8	5.5	8.8	7.5	1.2
Furnace, kiln, and oven operators, except food	100.0	9.9	.6	9.2	77.1	35.9	22.2	7.9	11.2	13.0	11.9	1.1
Slicing and cutting machine operators	100.0	23.8	4.7	19.1	62.9	29.7	19.1	7.8	6.3	13.3	11.1	2.2
Miscellaneous machine operators, n.e.c.	100.0	18.9	3.5	15.4	69.3	29.1	24.8	8.6	6.8	11.7	10.6	1.2
Machine operators, not specified	100.0	19.1	4.1	14.9	67.9	30.0	22.2	8.4	7.3	13.0	11.9	1.1
Fabricators, assemblers, and handworking occupations	100.0	19.5	4.6	14.9	70.0	32.2	24.0	7.3	6.5	10.4	9.3	1.1
Welders and cutters	100.0	16.1	3.0	13.1	74.1	35.5	24.9	7.2	6.5	9.8	9.1	.7
Assemblers	100.0	20.4	5.2	15.3	69.1	30.7	23.9	7.7	6.9	10.4	9.5	.9
Production inspectors, testers, samplers, and weighers	100.0	13.6	2.2	11.4	71.1	28.6	22.4	10.4	9.7	15.3	13.7	1.6
Production inspectors, checkers, and examiners	100.0	12.4	1.7	10.8	71.5	27.5	23.2	10.9	9.8	16.1	14.8	1.3
Graders and sorters, except agricultural	100.0	19.6	4.8	14.8	67.9	32.4	15.7	9.1	10.8	12.4	9.8	2.7

See footnotes at end of table.

Table C-2. Continued—Age distribution for selected occupations with 100,000 or more employees, 1984

(Percent)

Occupation	Total	Percent of employees										
		Age 16-24			Age 25-54					Age 55 and older		
		Total	16-19	20-24	Total	25-34	35-44	45-49	50-54	Total	55-64	65 and older
Transportation and material moving occupations	100.0	15.8	3.4	12.5	70.9	30.0	23.2	9.5	8.1	13.3	11.6	1.7
Motor vehicle operators	100.0	16.2	4.0	12.2	70.7	29.7	23.6	9.4	8.0	13.0	11.1	1.9
Truckdrivers, heavy	100.0	12.6	1.9	10.8	75.1	30.2	25.2	10.8	8.8	12.3	11.2	1.1
Truckdrivers, light	100.0	36.2	12.9	23.3	53.7	29.3	15.0	4.7	4.7	10.0	7.6	2.4
Driver-sales workers	100.0	13.5	3.1	10.4	78.2	37.0	25.4	8.5	7.4	8.2	7.8	.5
Busdrivers	100.0	8.9	2.8	6.1	73.3	24.8	29.3	10.5	8.6	17.8	15.1	2.7
Taxicab drivers and chauffeurs[1]	100.0	14.5	3.6	10.9	63.2	27.8	19.3	7.4	8.6	22.3	15.0	7.3
Transportation occupations, except motor vehicle	100.0	8.3	.5	7.9	73.9	27.9	26.4	9.9	9.6	17.8	17.1	.7
Rail transportation occupations	100.0	3.4	.1	3.3	78.5	30.4	27.4	10.8	9.9	18.1	17.3	.7
Material moving equipment operators	100.0	16.1	2.0	14.1	70.6	31.5	21.5	9.7	7.9	13.2	12.0	1.2
Operating engineers	100.0	11.2	1.2	10.0	75.6	33.0	22.6	10.5	9.5	13.2	12.4	.9
Grader, dozer, and scraper operators	100.0	12.8	1.5	11.3	64.9	25.8	19.7	9.5	9.9	22.4	19.6	2.7
Industrial truck and tractor equipment operators	100.0	20.9	2.8	18.1	69.4	33.0	20.8	8.2	7.4	9.6	9.1	.6
Miscellaneous material moving equipment operators	100.0	17.3	2.8	14.4	68.6	32.1	21.8	8.2	6.5	14.1	12.2	2.0
Handlers, equipment cleaners, helpers, and laborers	100.0	43.5	19.3	24.2	48.6	24.8	13.8	5.1	4.8	7.9	6.6	1.3
Helpers, construction and extractive occupations	100.0	56.9	23.4	33.5	40.1	26.0	8.4	2.5	3.2	3.0	2.6	.4
Helpers, construction trades	100.0	57.8	24.0	33.8	39.2	26.3	7.5	2.5	2.9	2.9	2.6	.3
Construction laborers	100.0	36.1	12.7	23.4	55.8	28.4	15.9	6.2	5.3	8.1	6.6	1.4
Freight, stock, and material movers, hand	100.0	53.9	28.3	25.5	39.8	21.4	10.6	4.4	3.4	6.3	5.1	1.2
Stock handlers and baggers	100.0	69.1	41.9	27.2	26.5	15.1	6.7	2.6	2.1	4.4	3.3	1.1
Freight, stock, and material movers, hand, n.e.c.	100.0	38.4	13.0	25.4	54.2	29.4	14.4	6.1	4.4	7.4	6.2	1.2
Garage and service station related occupations[1]	100.0	57.0	27.8	29.2	34.7	18.4	8.9	4.1	3.3	8.2	5.6	2.7
Vehicle washers and equipment cleaners[1]	100.0	52.1	21.8	30.3	41.9	21.3	11.2	5.9	3.5	6.0	5.3	.7
Hand packers and packagers	100.0	25.8	8.9	16.9	61.5	27.8	19.0	6.5	8.3	12.6	11.6	1.1
Laborers, except construction	100.0	31.3	10.2	21.1	59.0	28.6	17.9	5.8	6.7	9.7	8.2	1.5

[1] This Current Population Survey occupation is equivalent to the Occupational Employment Statistics survey occupation with the same title.

n.e.c. = not elsewhere classified.

NOTE: Due to rounding, individual items may not add to totals.

SOURCE: Current Population Survey.

Appendix D. Statistics on How Workers Get Their Training, by Occupation

This appendix presents data by detailed occupation on workers who reported that specific skills or training were needed to obtain their current jobs, based on a supplement to the January 1983 Current Population Survey (see discussion in chapter 4). Table D-1 presents data on the total number of workers who needed training from any source to obtain their jobs. Tables D-2 through D-11 contain information on the different sources of training.

Table D-1. Occupational distribution of workers who needed specific training to qualify for their jobs, 1983

Occupation	Number who needed training (thousands)	Percent of—	
		Total employment in occupation	Total who needed training
Total, all occupations	53,890	55.4	100.0
Professional specialty occupations	11,797	92.6	21.9
Teachers, elementary school	1,554	98.1	2.9
Teachers, secondary school	1,280	96.7	2.4
Registered nurses	1,262	97.9	2.3
Lawyers	548	94.8	1.0
Physicians	482	98.4	.9
Electrical and electronic engineers	404	92.4	.8
Social workers	316	85.7	.6
Clergy	284	92.6	.5
Teachers, prekindergarten and kindergarten	281	86.0	.5
Designers	266	80.4	.5
Computer systems analysts and scientists	243	93.9	.5
Industrial engineers	199	85.4	.4
Mechanical engineers	198	89.3	.4
Editors and reporters	181	84.4	.3
Pharmacists	180	99.2	.3
Civil engineers	175	84.7	.3
Librarians	169	81.1	.3
Counselors, educational and vocational	164	93.4	.3
Musicians and composers	126	86.6	.2
Dentists	123	97.4	.2
Painters, sculptors, craft-artists, and artist printmakers	121	82.9	.2
Psychologists	121	97.8	.2
Operations and systems researchers and analysts	117	85.5	.2
Chemists, except biochemists	106	96.2	.2
Photographers	99	80.5	.2
Aerospace engineers	94	100.0	.2
Architects	91	93.9	.2
Public relations specialists	84	71.5	.2
Inhalation therapists	76	93.6	.1
Economists	75	88.0	.1
Geologists and geodesists	70	96.9	.1
Chemical engineers	69	94.7	.1
Speech therapists	65	100.0	.1
Actors and directors	60	92.7	.1
English teachers	57	97.7	.1
Physical therapists	55	95.8	.1
Dietitians	55	75.8	.1
Authors	54	83.2	.1
Biological and life scientists	51	100.0	(1)

See footnote at end of table.

Table D-1. Continued—Occupational distribution of workers who needed specific training to qualify for their jobs, 1983

Occupation	Number who needed training (thousands)	Percent of—	
		Total employment in occupation	Total who needed training
Forestry and conservation scientists	50	93.4	(1)
Mathematical sciences teachers	48	92.8	(1)
Athletes	48	86.5	(1)
Recreation workers	43	84.5	(1)
Administrative support occupations, including clerical	9,157	56.8	17.0
Secretaries	2,746	72.8	5.1
Bookkeepers, accounting and auditing clerks	1,195	59.8	2.2
Typists	593	70.0	1.1
Computer operators	408	75.2	.8
Receptionists	285	46.2	.5
General office clerks	274	51.4	.5
Bank tellers	266	59.2	.5
Supervisors, general office	228	65.0	.4
Data entry keyers	213	71.3	.4
Investigators and adjusters, except insurance	179	64.1	.3
Teacher aides	170	46.6	.3
Stock and inventory clerks	168	31.3	.3
Insurance adjusters, examiners, and investigators	132	65.9	.2
Telephone operators	119	51.4	.2
Payroll and timekeeping clerks	118	58.0	.2
Production coordinators	117	60.4	.2
Records clerks	105	51.4	.2
Order clerks	101	49.8	.2
Traffic, shipping, and receiving clerks	99	23.0	.2
Billing clerks	99	55.6	.2
Stenographers	87	88.0	.2
File clerks	87	33.1	.2
Postal clerks, except mail carriers	73	31.0	.1
Interviewers	72	48.6	.1
Supervisors; distribution, scheduling, and adjusting clerks	70	40.3	.1
Transportation, ticket, and reservation agents	61	53.8	.1
Supervisors, financial records processing	61	70.0	.1
Mail carriers, postal service	59	22.2	.1
Dispatchers	59	39.8	.1
Statistical clerks	54	66.8	.1
Cost and rate clerks	52	44.2	(1)
Bill and account collectors	50	47.7	(1)
Expediters	45	37.3	(1)
Personnel clerks, except payroll and timekeeping	43	56.6	(1)
Mail clerks, except postal service	40	23.2	(1)
Eligibility clerks, social welfare	40	58.5	(1)
Library clerks	33	24.1	(1)
Weighers, measurers, and checkers	27	32.7	(1)
Hotel clerks	24	46.6	(1)
Messengers	15	13.0	(1)
Executive, administrative, and managerial occupations	7,738	71.4	14.4
Accountants and auditors	962	88.9	1.8
Administrators, education and related fields	400	86.2	.7
Managers; marketing, advertising, and public relations	337	74.3	.6
Administrators and officials, public administration	312	71.4	.6
Financial managers	310	82.6	.6
Personnel, training, and labor relations specialists	251	73.9	.5
Managers, properties and real estate	124	48.7	.2
Inspectors and compliance officers, except construction	110	73.0	.2
Management analysts	108	74.8	.2
Buyers, wholesale and retail trade, except farm products	106	50.7	.2
Managers, medicine and health	96	78.4	.2
Personnel and labor relations managers	83	76.1	.2
Purchasing managers	60	66.6	.1
Construction inspectors	40	60.7	(1)
Business and promotion agents	33	55.8	(1)
Precision production, craft, and repair occupations	7,603	65.1	14.1
Supervisors, production occupations	676	56.3	1.3
Carpenters	639	64.6	1.2
Automobile mechanics	549	70.0	1.0

See footnote at end of table.

Table D-1. Continued—Occupational distribution of workers who needed specific training to qualify for their jobs, 1983

Occupation	Number who needed training (thousands)	Percent of—	
		Total employment in occupation	Total who needed training
Electricians	465	84.8	.9
Machinists	342	74.4	.6
Industrial machinery repairers	308	63.3	.6
Plumbers, pipefitters, and steamfitters	299	77.5	.6
Supervisors, mechanics and repairers	202	68.1	.4
Bus, truck, and stationary engine mechanics	177	64.7	.3
Painters, construction and maintenance	161	47.5	.3
Telephone installers and repairers	147	56.8	.3
Butchers and meat cutters	144	49.7	.3
Heating, air conditioning, and refrigeration mechanics	140	75.2	.3
Tool and die makers	138	84.5	.3
Electronic repairers, communications and industrial equipment	129	74.9	.2
Automobile body and related repairers	118	66.3	.2
Heavy equipment mechanics	101	61.6	.2
Brickmasons and stonemasons	94	69.5	.2
Inspectors, testers, and graders	93	68.9	.2
Data processing equipment repairers	89	91.7	.2
Sheet-metal workers	87	67.4	.2
Aircraft engine mechanics	79	82.1	.1
Stationary engineers	75	66.7	.1
Carpet installers	75	70.0	.1
Dressmakers	64	59.4	.1
Office machine repairers	62	86.8	.1
Drywall installers	60	71.5	.1
Electrical power installers and repairers	57	52.9	.1
Roofers	56	55.4	.1
Bakers	55	44.9	.1
Upholsterers	53	80.2	(1)
Telephone line installers and repairers	51	73.7	(1)
Millwrights	50	59.7	(1)
Camera, watch, and music instrument repairers	50	90.7	(1)
Supervisors, extractive occupations	48	62.2	(1)
Structural metal workers	41	66.5	(1)
Dental laboratory and medical appliance technicians	39	73.8	(1)
Optical goods workers	35	65.4	(1)
Drillers, oil well	25	43.3	(1)
Electrical and electronic equipment assemblers	17	21.2	(1)
Sales occupations	4,867	43.4	9.0
Supervisors and proprietors, sales occupations	1,392	50.1	2.6
Sales representatives; mining, manufacturing, and wholesale trade	697	53.8	1.3
Cashiers	544	27.8	1.0
Real estate sales occupations	431	89.1	.8
Insurance sales occupations	421	76.1	.8
Securities and financial services sales occupations	146	77.4	.3
Street and door-to-door sales workers	108	28.0	.2
Sales workers, apparel	84	20.8	.2
Sales workers, motor vehicles and boats	64	37.8	.1
Advertising and related sales occupations	62	49.7	.1
Sales workers, parts	58	36.9	.1
Sales workers; radio, TV, hi-fi, and appliances	58	41.9	.1
Sales workers, furniture and home furnishings	57	36.6	.1
Sales workers, hardware and building supplies	56	28.0	.1
Sales engineers	42	77.5	(1)
Sales workers, shoes	28	22.3	(1)
Sales counter clerks	27	23.0	(1)
News vendors	7	4.7	(1)
Service workers, except private household	4,397	35.5	8.2
Nursing aides, orderlies, and attendants	790	63.6	1.5
Hairdressers and cosmetologists	570	96.5	1.1
Cooks, except short order	412	29.9	.8
Police and detectives, public service	303	80.1	.6
Waiters and waitresses	299	23.7	.6
Janitors and cleaners	237	12.3	.4
Guards and police, except public service	227	37.4	.4

See footnote at end of table.

Table D-1. Continued—Occupational distribution of workers who needed specific training to qualify for their jobs, 1983

Occupation	Number who needed training (thousands)	Percent of—	
		Total employment in occupation	Total who needed training
Health aides, except nursing	171	52.6	.3
Childcare workers, except private household	116	17.9	.2
Supervisors, food preparation and service occupations	113	53.4	.2
Bartenders	111	36.3	.2
Correctional institution officers	101	63.9	.2
Barbers	97	87.7	.2
Dental assistants	96	73.2	.2
Firefighting occupations	93	54.5	.2
Sheriffs, bailiffs, and other law enforcement officers	67	70.3	.1
Maids and housemen	57	11.6	.1
Supervisors, cleaning and building service workers	51	41.0	(3)
Supervisors, police and detectives	42	56.7	(3)
Attendants, amusement and recreation facilities	39	32.3	(3)
Waiters' and waitresses' assistants	36	10.7	(3)
Food counter, fountain, and related occupations	31	12.4	(3)
Kitchen workers, food preparation	27	18.3	(3)
Welfare service aides	22	26.0	(3)
Short-order cooks	9	11.7	(3)
Machine operators, assemblers, and inspectors	2,742	37.0	5.1
Welders and cutters	355	67.5	.7
Textile sewing machine operators	252	33.2	.5
Assemblers	229	23.6	.4
Production inspectors, checkers, and examiners	222	38.3	.4
Printing machine operators	187	61.9	.3
Paint and spray machine operators	80	43.3	.1
Photographic process machine operators	74	69.5	.1
Furnace, kiln, and oven operators, except food	66	52.1	.1
Grinding, abrading, buffing, and polishing machine operators	56	36.3	.1
Winding and twisting machine operators	53	51.3	(3)
Production testers	53	70.1	(3)
Typesetters and compositors	52	71.7	(3)
Packaging and filling machine operators	51	14.1	(3)
Slicing and cutting machine operators	50	24.3	(3)
Laundry and dry cleaning machine operators	45	24.5	(3)
Lathe and turning machine operators	45	59.9	(3)
Pressing machine operators	33	25.5	(3)
Mixing and blending machine operators	31	22.6	(3)
Punching and stamp press machine operators	27	25.9	(3)
Separating, filtering, and clarifying machine operators	26	42.7	(3)
Shoe machine operators	23	27.6	(3)
Molding and casting machine operators	20	23.4	(3)
Sawing machine operators	15	18.3	(3)
Metal plating machine operators	14	25.1	(3)
Crushing and grinding machine operators	13	25.4	(3)
Graders and sorters, except agriculture	11	12.8	(3)
Technicians and related support occupations	2,579	84.6	4.8
Licensed practical nurses	419	95.3	.8
Computer programmers	371	91.1	.7
Electrical and electronic technicians	260	87.7	.5
Clinical laboratory technologists and technicians	240	88.2	.4
Drafting occupations	218	84.7	.4
Radiologic technicians	99	92.4	.2
Dental hygienists	96	92.7	.2
Legal assistants	85	79.4	.2
Chemical technicians	53	62.9	(3)
Biological technicians	40	73.1	(3)
Transportation and material moving occupations	1,462	36.3	2.7
Truck drivers, heavy	574	36.1	1.1
Bus drivers	231	58.0	.4
Industrial truck and tractor equipment operators	105	30.1	.2
Truck drivers, light	83	19.8	.2
Driver-sales workers	60	28.1	.1
Crane and tower operators	55	59.0	.1
Operating engineers	55	45.7	.1

See footnote at end of table.

Table D-1. Continued—Occupational distribution of workers who needed specific training to qualify for their jobs, 1983

Occupation	Number who needed training (thousands)	Percent of—	
		Total employment in occupation	Total who needed training
Excavating and loading machine operators	40	43.2	[1]
Grader, dozer, and scraper operators	39	50.0	[1]
Taxicab drivers and chauffeurs	33	17.6	[1]
Locomotive operating occupations	33	60.7	[1]
Farming, forestry, and fishing occupations	862	27.9	1.6
Farmers, except horticulture	406	30.5	.8
Farm workers	164	19.0	.3
Groundskeepers and gardeners, except farm	75	22.5	.1
Animal caretakers, except farm	59	52.3	.1
Managers, farms, except horticulture	26	37.6	[1]
Supervisors, related agricultural occupations	25	32.2	[1]
Timber cutting and logging occupations	24	27.1	[1]
Fishers	17	34.4	[1]
Handlers, equipment cleaners, helpers, and laborers	605	16.2	1.1
Laborers, except construction	158	17.0	.3
Stock handlers and baggers	91	12.1	.2
Construction laborers	88	20.0	.2
Hand packers and packagers	46	16.6	[1]
Garage and service station related occupations	45	16.1	[1]
Helpers, construction trades	35	24.5	[1]
Machine feeders and offbearers	24	26.7	[1]
Vehicle washers and equipment cleaners	20	13.8	[1]
Production helpers	18	27.7	[1]
Garbage collecters	6	8.0	[1]
Private household occupations	81	8.3	.2
Child care workers, private household	41	9.7	[1]
Private household cleaners and servants	28	5.7	[1]

[1] Less than 0.1 percent.

NOTE: Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

Table D-2. Occupational distribution of workers who used training in 4-year or longer college programs to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Total, all occupations	13,078	16.5	100.0
Professional specialty occupations	8,961	70.4	55.7
Teachers, elementary school	1,469	92.7	9.1
Teachers, secondary school	1,194	90.2	7.4
Registered nurses	585	45.4	3.6
Lawyers	524	90.6	3.3
Physicians	454	92.8	2.8
Electrical and electronic engineers	275	62.9	1.7
Social workers	240	65.2	1.5
Clergy	223	72.6	1.4
Teachers, prekindergarten and kindergarten	219	67.1	1.4
Pharmacists	160	88.5	1.0
Counselors, educational and vocational	148	84.5	.9
Librarians	144	69.0	.9
Civil engineers	141	68.4	.9
Computer systems analysts and scientists	135	52.3	.8
Mechanical engineers	129	58.3	.8
Dentists	123	97.0	.8
Editors and reporters	119	55.4	.7
Designers	118	35.7	.7
Industrial engineers	116	49.9	.7
Psychologists	115	93.0	.7
Chemists, except biochemists	88	80.1	.5
Architects	79	81.4	.5
Aerospace engineers	69	73.2	.4
Musicians and composers	67	46.2	.4
Geologists and geodesists	65	90.1	.4
Chemical engineers	61	84.4	.4
Speech therapists	60	93.0	.4
Operations and systems researchers and analysts	60	43.7	.4
Painters, sculptors, craft-artists, and artist printmakers	53	36.5	.3
English teachers	53	92.1	.3
Public relations specialists	49	41.3	.3
Biological and life scientists	48	94.2	.3
Physical therapists	48	84.0	.3
Mathematical sciences teachers	47	89.9	.3
Economists	45	53.1	.3
Forestry and conservation scientists	41	77.0	.3
Authors	34	52.3	.2
Dietitians	32	45.0	.2
Athletes	29	52.6	.2
Actors and directors	29	44.8	.2
Photographers	26	21.4	.2
Recreation workers	25	48.8	.2
Inhalation therapists	13	15.8	(1)
Executive, administrative, and managerial occcupations	3,638	33.6	22.6
Accountants and auditors	678	62.7	4.2
Administrators, education and related fields	343	73.8	2.1
Managers; marketing, advertising, and public relations	173	38.3	1.1
Financial managers	164	43.7	1.0
Administrators and officials, public administration	157	36.0	1.0
Personnel, training, and labor relations specialists	103	30.2	.6
Management analysts	63	43.3	.4
Managers, medicine and health	57	46.8	.4
Inspectors and compliance officers, except construction	48	32.1	.3
Personnel and labor relations managers	38	34.7	.2
Buyers, wholesale and retail trade, except farm products	38	17.9	.2
Managers, properties and real estate	37	14.4	.2
Purchasing managers	35	38.3	.2
Administrative support occupations, including clerical	976	6.1	6.1
Secretaries	270	7.1	1.7
Bookkeepers, accounting and auditing clerks	149	7.5	.9
Investigators and adjusters, except insurance	54	19.2	.3
Teacher aides	43	11.7	.3

See footnote at end of table.

Table D-2. Continued—Occupational distribution of workers who used training in 4-year or longer college programs to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Supervisors, general office	42	12.1	0.3
Computer operators	40	7.4	.2
Insurance adjusters, examiners, and investigators	28	14.0	.2
Typists	28	3.2	.2
Supervisors, financial records processing	25	29.4	.2
Receptionists	24	3.9	.2
General office clerks	24	4.5	.1
Records clerks	20	9.6	.1
Interviewers	15	10.1	(1)
Stenographers	14	14.7	(1)
Stock and inventory clerks	14	2.5	(1)
Production coordinators	12	6.0	(1)
Bank tellers	12	2.6	(1)
Order clerks	10	4.9	(1)
Statistical clerks	8	9.6	(1)
Traffic, shipping, and receiving clerks	7	1.7	(1)
Library clerks	7	5.2	(1)
Supervisors; distribution, scheduling, and adjusting clerks	7	3.9	(1)
Payroll and timekeeping clerks	7	3.3	(1)
Billing clerks	6	3.6	(1)
Eligibility clerks, social welfare	6	8.6	(1)
Sales occupations	941	8.4	5.9
Supervisors and proprietors, sales occupations	314	11.3	2.0
Sales representatives; mining, manufacturing, wholesale trade	226	17.4	1.4
Insurance sales occupations	89	16.1	.6
Real estate sales occupations	82	16.9	.5
Securities and financial services sales occupations	58	31.0	.4
Advertising and related sales occupations	17	14.0	.1
Sales engineers	16	29.2	(1)
Cashiers	15	.8	(1)
Sales workers; radio, TV, hi-fi, and appliances	9	6.4	(1)
Sales workers, apparel	7	1.7	(1)
Street and door-to-door sales workers	7	1.7	(1)
Sales workers, furniture and home furnishings	7	4.3	(1)
Sales workers, hardware and building supplies	6	2.8	(1)
Technicians and related support occupations	744	24.4	4.6
Computer programmers	161	39.6	1.0
Clinical laboratory technologists and technicians	109	39.8	.7
Drafting occupations	56	21.7	.3
Dental hygienists	50	48.3	.3
Electrical and electronic technicians	33	11.2	.2
Legal assistants	32	30.4	.2
Chemical technicians	27	31.6	.2
Biological technicians	21	37.6	.1
Licensed practical nurses	17	3.9	.1
Radiologic technicians	11	10.6	(1)
Service workers, except private household	316	2.6	2.0
Police and detectives, public service	63	16.7	.4
Nursing aides, orderlies, and attendants	39	3.1	.2
Health aides, except nursing	34	10.4	.2
Childcare workers, except private household	23	3.5	.1
Guards and police, except public service	16	2.6	(1)
Correctional institution officers	14	9.1	(1)
Sheriffs, bailiffs, and other law enforcement officers	13	13.4	(1)
Cooks, except short order	10	.7	(1)
Supervisors, food preparation and service occupations	9	4.4	(1)
Dental assistants	8	6.4	(1)
Supervisors, police and detectives	7	10.1	(1)
Supervisors, cleaning and building service workers	7	5.5	(1)
Janitors and cleaners	6	.3	(1)

See footnote at end of table.

Table D-2. Continued—Occupational distribution of workers who used training in 4-year or longer college programs to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Precision production, craft, and repair occupations	282	2.4	0.8
Supervisors, production occupations	99	8.2	.6
Carpenters	21	2.1	.1
Electricians	14	2.5	(1)
Supervisors, mechanics and repairers	11	3.9	(1)
Dressmakers	8	7.8	(1)
Data processing equipment repairers	8	7.7	(1)
Industrial machinery repairers	6	1.2	(1)
Farming, forestry, and fishing occupations	128	4.1	.8
Farmers, except horticulture	80	6.0	.5
Managers, farms, except horticulture	11	15.7	(1)
Farm workers	7	.8	(1)
Animal caretakers, except farm	6	5.3	(1)
Machine operators, assemblers, and inspectors	69	.9	.4
Production inspectors, checkers, and examiners	16	2.7	(1)
Production testers	14	19.3	(1)
Photographic process machine operators	7	6.8	(1)
Transportation and material moving occupations	10	.3	(1)
Handlers, equipment cleaners, helpers, and laborers	7	.2	(1)
Private household occupations	4	.4	(1)

[1] Less than 0.1 percent.

NOTE: Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

Table D-3. Occupational distribution of workers who used training from junior colleges or technical institutes to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Total, all occupations	4,965	5.1	100.0
Administrative support occupations, including clerical	1,282	8.0	25.8
Secretaries	530	14.1	10.7
Bookkeepers, accounting and auditing clerks	172	8.6	3.5
Computer operators	80	14.8	1.6
Typists	63	7.4	1.3
Receptionists	48	7.8	1.0
Teacher aides	40	10.9	.8
General office clerks	29	5.4	.6
Data entry keyers	28	9.3	.6
Supervisors, general office	25	7.2	.5
Payroll and timekeeping clerks	22	10.6	.4
Bank tellers	17	3.7	.3
Stock and inventory clerks	16	3.0	.3
Investigators and adjusters, except insurance	16	5.7	.3
Interviewers	15	9.9	.3
Stenographers	14	14.6	.3
Eligibility clerks, social welfare	11	16.2	.2
Production coordinators	8	4.2	.2
Records clerks	8	4.0	.2
File clerks	8	3.0	.2
Supervisors; distribution, scheduling, and adjusting clerks	8	4.3	.2
Insurance adjusters, examiners, and investigators	7	3.7	.1
Weighers, measurers, and checkers	7	8.3	.1
Library clerks	6	4.6	.1
Billing clerks	6	3.5	.1
Dispatchers	5	3.6	.1
Statistical clerks	5	6.5	.1
Order clerks	5	2.5	.1
Personnel clerks, except payroll and timekeeping	5	6.5	(1)
Traffic, shipping, and receiving clerks	5	1.1	(1)
Professional specialty occupations	906	7.1	18.3
Registered nurses	372	28.9	7.5
Teachers, elementary school	42	2.6	.8
Designers	37	11.3	.8
Inhalation therapists	37	45.7	.7
Teachers, prekindergarten and kindergarten	35	10.8	.7
Teachers, secondary school	29	2.2	.6
Painters, sculptors, craft-artists, and artist printmakers	27	18.2	.5
Computer systems analysts and scientists	24	9.2	.5
Mechanical engineers	23	10.2	.5
Electrical and electronic engineers	19	4.4	.4
Operations and systems researchers and analysts	13	9.3	.3
Clergy	12	4.1	.3
Civil engineers	11	5.2	.2
Editors and reporters	10	4.7	.2
Chemists, except biochemists	10	9.0	.2
Psychologists	9	7.1	.2
Actors and directors	8	12.4	.2
Musicians and composers	8	5.2	.2
Photographers	7	6.0	.1
Industrial engineers	7	3.0	.1
Pharmacists	7	3.9	.1
Physical therapists	7	11.5	.1
Authors	6	8.9	.1
Architects	5	5.2	.1
Social workers	5	1.3	(1)
Technicians and related support occupations	600	19.7	12.1
Licensed practical nurses	148	33.7	3.0
Computer programmers	75	18.5	1.5
Electrical and electronic technicians	75	25.3	1.5
Clinical laboratory technologists and technicians	65	23.9	1.3

See footnote at end of table.

Table D-3. Continued—Occupational distribution of workers who used training from junior colleges or technical institutes to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Drafting occupations	57	22.0	1.1
Radiologic technicians	42	39.0	.8
Dental hygienists	39	37.7	.8
Legal assistants	9	8.0	.2
Executive, administrative, and managerial occupations	581	5.4	11.7
Accountants and auditors	91	8.4	1.8
Financial managers	24	6.4	.5
Managers, properties and real estate	22	8.8	.5
Administrators and officials, public administration	21	4.9	.4
Personnel, training, and labor relations specialists	18	5.2	.4
Managers; marketing, advertising, and public relations	13	3.0	.3
Administrators, education and related fields	13	2.9	.3
Management analysts	10	6.6	.2
Inspectors and compliance officers, except construction	8	5.3	.2
Buyers, wholesale and retail trade, except farm products	7	3.3	.1
Personnel and labor relations managers	7	6.2	.1
Construction inspectors	6	8.8	.1
Precision production, craft, and repair occupations	568	4.9	11.4
Automobile mechanics	55	7.0	1.1
Supervisors, production occupations	49	4.1	1.0
Electricians	45	8.2	.9
Machinists	34	7.4	.7
Heating, air conditioning, and refrigeration mechanics	28	15.1	.6
Industrial machinery repairers	25	5.2	.5
Data processing equipment repairers	25	25.3	.5
Electronic repairers, communications and industrial equipment	18	10.5	.4
Bus, truck, and stationary engine mechanics	17	6.2	.3
Aircraft engine mechanics	17	17.2	.3
Carpenters	16	1.6	.3
Office machine repairers	15	20.4	.3
Stationary engineers	13	11.8	.3
Inspectors, testers, and graders	12	8.9	.2
Heavy equipment mechanics	12	7.1	.2
Supervisors, mechanics and repairers	10	3.3	.2
Automobile body and related repairers	10	5.4	.2
Plumbers, pipefitters, and steamfitters	9	2.3	.2
Tool and die makers	8	4.7	.2
Optical goods workers	7	13.0	.1
Telephone installers and repairers	7	2.7	.1
Painters, construction and maintenance	5	1.6	.1
Sheet-metal workers	5	4.0	.1
Camera, watch, and musical instrument repairers	5	8.6	(1)
Upholsterers	5	7.1	(1)
Service workers, except private household	461	3.7	9.3
Nursing aides, orderlies, and attendants	136	11.0	2.7
Hairdressers and cosmetologists	73	12.3	1.5
Police and detectives, public service	39	10.2	.8
Health aides, except nursing	31	9.4	.6
Dental assistants	25	19.1	.5
Barbers	22	19.9	.4
Cooks, except short order	18	1.3	.4
Sheriffs, bailiffs, and other law enforcement officers	14	15.1	.3
Guards and police, except public service	14	2.3	.3
Supervisors, food preparation and service occupations	12	5.5	.2
Firefighting occupations	11	6.6	.2
Childcare workers, except private household	8	1.2	.2
Correctional institution officers	7	4.5	.1
Welfare service aides	7	7.8	.1
Supervisors, police and detectives	5	7.5	.1
Janitors and cleaners	4	.2	(1)

See footnote at end of table.

Table D-3. Continued—Occupational distribution of workers who used training from junior colleges or technical institutes to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Sales occupations	356	3.2	7.2
Real estate sales occupations	113	23.3	2.3
Supervisors and proprietors, sales occupations	89	3.2	1.8
Sales representatives; mining, manufacturing, wholesale trade	35	2.7	.7
Insurance sales occupations	28	5.1	.6
Cashiers	24	1.2	.5
Sales engineers	11	19.5	.2
Securities and financial services sales occupations	10	5.3	.2
Machine operators, assemblers, and inspectors	115	1.6	2.3
Welders and cutters	34	6.4	.7
Production inspectors, checkers, and examiners	12	2.1	.2
Printing machine operators	8	2.8	.2
Photographic process machine operators	6	6.0	.1
Lathe and turning machine operators	6	7.7	.1
Farming, forestry, and fishing occupations	58	1.9	1.2
Farmers, except horticulture	21	1.6	.4
Farm workers	11	1.2	.2
Handlers, equipment cleaners, helpers, and laborers	21	.6	.4
Stock handlers and baggers	9	1.2	.2
Laborers, except construction	6	.7	.1
Transportation and material moving occupations	18	.4	.4
Truck drivers, heavy	10	.7	.2
Private household occupations	–	–	–

[1]Less than 0.1 percent.

NOTE: Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals. Dash indicates that data were not reported.

Table D-4. Occupational distribution of workers who used high school vocational training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Total, all occupations	4,692	4.8	100.0
Administrative support occupations, including clerical	2,659	16.4	56.7
Secretaries	1,323	35.1	28.2
Bookkeepers, accounting and auditing clerks	341	17.1	7.3
Typists	306	36.1	6.5
Receptionists	84	13.6	1.8
General office clerks	68	12.8	1.4
Computer operators	62	11.4	1.3
Billing clerks	39	21.9	.8
Data entry keyers	37	12.4	.8
Bank tellers	35	7.7	.7
File clerks	29	11.2	.6
Stenographers	25	25.5	.5
Teacher aides	23	6.4	.5
Payroll and timekeeping clerks	23	11.3	.5
Stock and inventory clerks	20	3.7	.4
Supervisors, general office	19	5.4	.4
Production coordinators	17	8.9	.4
Records clerks	16	8.1	.4
Insurance adjusters, examiners, and investigators	15	7.5	.3
Personnel clerks, except payroll and timekeeping	14	18.7	.3
Interviewers	8	5.4	.2
Telephone operators	8	3.3	.2
Order clerks	7	3.7	.2
Expeditors	7	6.0	.2
Library clerks	7	5.1	.2
Statistical clerks	7	8.6	.1
Eligibility clerks, social welfare	7	9.9	.1
Dispatchers	6	4.1	.1
Bill and account collectors	5	5.1	.1
Traffic, shipping, and receiving clerks	3	.7	(1)
Precision production, craft, and repair occupations	606	5.2	12.9
Automobile mechanics	101	12.8	2.1
Carpenters	52	5.3	1.1
Electricians	51	9.3	1.1
Machinists	44	9.6	.9
Supervisors, production occupations	33	2.8	.7
Industrial machinery repairers	30	6.1	.6
Tool and die makers	25	15.6	.5
Bus, truck, and stationary engine mechanics	14	5.0	.3
Plumbers, pipefitters, and steamfitters	13	3.3	.3
Supervisors, mechanics and repairers	11	3.9	.2
Heating, air conditioning, and refrigeration mechanics	11	6.1	.2
Electronic repairers, communications and industrial equipment	11	6.5	.2
Dressmakers	10	9.6	.2
Sheet-metal workers	10	7.4	.2
Data processing equipment repairers	8	8.1	.2
Heavy equipment mechanics	8	4.6	.2
Bakers	7	6.0	.2
Telephone installers and repairers	6	2.5	.1
Automobile body and related repairers	6	3.5	.1
Aircraft engine mechanics	6	6.0	.1
Butchers and meat cutters	6	2.0	.1
Office machine repairers	5	7.6	.1
Stationary engineers	5	4.5	.1
Brickmasons and stonemasons	4	3.2	(1)
Electrical power installers and repairers	4	3.3	(1)
Executive, administrative, and managerial occupations	333	3.1	7.1
Accountants and auditors	49	4.5	1.0
Administrators and officials, public administration	13	3.1	.3
Financial managers	9	2.3	.2
Administrators, education and related fields	8	1.7	.2
Management analysts	6	4.2	.1

See footnote at end of table.

Table D-4. Continued—Occupational distribution of workers who used high school vocational training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Managers, properties and real estate	5	2.2	0.1
Buyers, wholesale and retail trade, except farm products	5	2.2	(1)
Business and promotion agents	3	5.3	(1)
Professional specialty occupations	208	1.6	4.4
Registered nurses	19	1.5	.4
Designers	12	3.6	.3
Computer systems analysts and scientists	11	4.4	.2
Photographers	10	8.4	.2
Painters, sculptors, craft-artists, and artist printmakers	8	5.3	.2
Teachers, elementary school	7	.5	.2
Clergy	7	2.0	.1
Public relations specialists	6	5.1	.1
Mechanical engineers	6	2.6	.1
Civil engineers	6	2.7	.1
Social workers	5	1.5	.1
Inhalation therapists	4	5.2	(1)
Actors and directors	4	6.1	(1)
Operations and systems researchers and analysts	4	2.8	(1)
Service workers, except private household	207	1.7	4.4
Nursing aides, orderlies, and attendants	50	4.1	1.1
Hairdressers and cosmetologists	41	7.0	.9
Janitors and cleaners	19	1.0	.4
Childcare workers, except private household	14	2.1	.3
Cooks, except short order	12	.9	.3
Police and detectives, public service	9	2.3	.2
Dental assistants	8	6.2	.2
Health aides, except nursing	7	2.1	.1
Guards and police, except public service	6	1.0	.1
Welfare service aides	5	5.5	.1
Supervisors, food preparation and service occupations	5	2.2	(1)
Machine operators, assemblers, and inspectors	196	2.6	4.2
Printing machine operators	41	13.7	.9
Welders and cutters	31	5.9	.7
Assemblers	16	1.7	.3
Typesetters and compositors	15	21.2	.3
Painting and paint spraying machine operators	9	4.8	.2
Lathe and turning machine operators	6	7.4	.1
Production inspectors, checkers, and examiners	5	.9	.1
Photographic process machine operators	4	4.2	(1)
Sawing machine operators	4	4.5	(1)
Sales occupations	185	1.6	3.9
Cashiers	48	2.4	1.0
Supervisors and proprietors, sales occupations	42	1.5	.9
Sales representatives; mining, manufacturing, wholesale trade	17	1.3	.4
Real estate sales occupations	12	2.4	.2
Insurance sales occupations	10	1.8	.2
Sales workers, furniture and home furnishings	8	5.1	.2
Sales workers; radio, TV, hi-fi, and appliances	6	4.1	.1
Advertising and related sales occupations	5	3.9	.1
Sales workers, apparel	4	1.0	.9
Technicians and related support occupations	149	4.9	3.2
Drafting occupations	64	24.9	1.4
Licensed practical nurses	19	4.4	.4
Electrical and electronic technicians	17	5.7	.4
Legal assistants	8	7.8	.2
Chemical technicians	6	7.2	.1
Computer programmers	6	1.4	.1
Clinical laboratory technologists and technicians	4	1.4	(1)
Farming, forestry, and fishing occupations	75	2.4	1.6
Farmers, except horticulture	43	3.2	.9

See footnote at end of table.

Table D-4. Continued—Occupational distribution of workers who used high school vocational training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Farm workers	18	2.1	0.4
Groundskeepers and gardeners, except farm	8	2.3	2
Transportation and material moving occupations	34	.9	.7
Bus drivers	11	2.8	.2
Truck drivers, heavy	6	.4	.1
Truck drivers, light	5	1.2	.1
Operating engineers	4	3.3	(1)
Taxicab drivers and chauffeurs	3	1.7	(1)
Handlers, equipment cleaners, helpers, and laborers	30	.8	.6
Construction laborers	9	2.0	.2
Helpers, construction trades	7	5.1	.2
Garage and service station related occupations	4	1.4	(1)
Laborers, except construction	4	.4	(1)
Private household occupations	9	1.0	.2
Childcare workers, private household	7	1.7	.2

[1]Less than 0.1 percent.

NOTE: Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

Table D-5. Occupational distribution of workers who used private post-high school vocational training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Total, all occupations	2,098	2.2	100.0
Administrative support occupations, including clerical	506	3.1	24.1
Secretaries	231	6.1	11.0
Bookkeepers, accounting and auditing clerks	71	3.6	3.4
Typists	24	2.8	1.2
Computer operators	22	4.0	1.0
Data entry keyers	13	4.3	.6
General office clerks	12	2.3	.6
Stenographers	11	11.4	.5
Billing clerks	11	6.3	.5
Receptionists	11	1.7	.5
Personnel clerks, except payroll and timekeeping	10	13.5	.5
Investigators and adjustors, except insurance	9	3.3	.4
Production coordinators	8	4.1	.4
Payroll and timekeeping clerks	7	3.7	.4
Bank tellers	7	1.6	.3
Supervisors, general office	5	1.6	.3
Service workers, except private household	442	3.6	21.1
Hairdressers and cosmetologists	266	45.0	12.7
Nursing aides, orderlies, and attendants	65	5.2	3.1
Barbers	34	30.8	1.6
Health aides, except nursing	17	5.2	.8
Cooks, short order	13	.9	.6
Police and detectives, public service	10	2.7	.5
Dental assistants	7	5.7	.4
Professional specialty occupations	367	2.9	17.5
Registered nurses	180	14.0	8.6
Clergy	15	4.9	.7
Electrical and electronic engineers	14	3.2	.7
Physicians	9	1.8	.4
Teachers, secondary school	8	.6	.4
Teachers, elementary school	8	.5	.4
Photographers	8	6.3	.4
Designers	8	2.3	.4
Operations and systems researchers and analysts	8	5.5	.4
Mechanical engineers	7	3.4	.4
Architects	6	6.7	.3
Editors and reporters	6	2.9	.3
Computer systems analysts and scientists	6	2.2	.3
Painters, sculptors, craft-artists, and artist printmakers	5	3.8	.3
Inhalation therapists	5	6.5	.2
Precision production, craft, and repair occupations	193	1.7	9.2
Automobile mechanics	24	3.1	1.2
Electricians	18	3.3	.9
Carpenters	16	1.6	.8
Supervisors, production occupations	9	.8	.5
Plumbers, pipefitters, and steamfitters	7	1.8	.3
Industrial machinery repairers	6	1.3	.3
Heating, air conditioning, and refrigeration mechanics	6	3.2	.3
Supervisors, mechanics and repairers	6	2.0	.3
Sheet-metal workers	6	4.4	.3
Electronic repairers, communications and industrial equipment	5	3.2	.3
Executive, administrative, and managerial occupations	169	1.6	8.1
Accountants and auditors	20	1.9	1.0
Managers, medicine and health	7	6.0	.4
Managers; marketing, advertising, and public relations	7	1.5	.3
Administrators and officials, public administration	5	1.1	.2
Technicians and related support occupations	168	5.5	8.0
Licensed practical nurses	55	12.5	2.6
Electrical and electronic technicians	26	6.7	1.2
Radiologic technicans	20	18.6	1.0

See footnote at end of table.

Table D-5. Continued—Occupational distribution of workers who used private post-high school vocational training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Computer programmers	15	3.6	0.7
Clinical laboratory technologists and technicians	12	4.4	.6
Drafting occupations	10	3.8	.5
Sales occupations	163	1.5	7.8
Real estate sales occupations	54	11.1	2.6
Supervisors and proprietors, sales occupations	45	1.6	2.2
Insurance sales occupations	19	3.5	.9
Cashiers	8	.4	.4
Sales representatives; mining, manufacturing, wholesale trade	8	.6	.4
Machine operators, asemblers, and inspectors	45	.6	2.2
Welders and cutters	17	3.2	.8
Textile sewing machine operators	5	.7	.3
Transportation and material moving occupations	23	.6	1.1
Truck drivers, heavy	10	.7	.5
Farming, forestry, and fishing occupations	15	.5	.7
Farmers, except horticulture	10	.7	.5
Handlers, equipment cleaners, helpers, and laborers	6	.2	.3
Private household occupations	2	.2	.1

NOTE: Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

Table D-6. Occupational distribution of workers who used public post-high school vocational training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Total, all occupations	1,586	1.6	100.0
Administrative support occupations, including clerical	367	2.3	23.2
Secretaries	144	3.8	9.1
Bookkeeping, accounting, and auditing clerks	49	2.4	3.1
Typists	36	4.2	2.3
Data entry keyers	17	5.6	1.1
Receptionists	14	2.2	.9
General office clerks	13	2.5	.8
Teacher aides	10	2.9	.7
Computer operators	9	1.7	.6
Bank tellers	7	1.5	.4
Stock and inventory clerks	6	1.1	.4
File clerks	5	1.8	.3
Precision production, craft, and repair occupations	280	2.4	17.6
Automobile mechanics	33	4.2	2.1
Electricians	32	5.9	2.0
Machinists	22	4.7	1.4
Heating, air conditioning, and refrigeration mechanics	18	9.4	1.1
Carpenters	16	1.6	1.0
Supervisors, production occupations	14	1.2	.9
Industrial machinery repairers	13	2.6	.8
Data processing equipment repairers	12	12.3	.8
Brickmasons and stonemasons	9	6.6	.6
Bus, truck, and stationary engine mechanics	9	3.1	.5
Tool and die makers	7	4.4	.5
Aircraft engine mechanics	7	6.7	.4
Supervisors, mechanics and repairers	6	2.1	.4
Plumbers, pipefitters, and steamfitters	6	1.6	.4
Millwrights	6	6.6	.4
Stationary engineers	5	4.7	.3
Professional specialty occupations	213	1.7	13.4
Registered nurses	43	3.4	2.7
Teachers, secondary school	19	1.4	1.2
Designers	15	4.6	1.0
Painters, sculptors, craft-artists, and artist printmakers	10	7.0	.6
Teachers, elementary school	10	.6	.6
Teachers, prekindergarten and kindergarten	8	2.5	.5
Photographers	7	5.7	.4
Social workers	7	1.8	.4
Mechanical engineers	7	3.0	.4
Civil engineers	6	3.0	.4
Electrical and electronic engineers	5	1.1	.3
Service workers, except private household	195	1.6	12.3
Nursing aides, orderlies, and attendants	67	5.4	4.2
Hairdressers and cosmetologists	64	10.8	4.0
Barbers	17	15.7	1.1
Janitors and cleaners	13	.7	.8
Guards and police, except public service	7	1.2	.4
Health aides, except nursing	5	1.5	.3
Police and detectives, public service	3	.8	.2
Childcare workers, except private household	3	.5	.2
Technicians and related support occupations	185	6.1	11.7
Licensed practical nurses	108	24.5	6.8
Drafting occupations	16	6.4	1.0
Computer programmers	15	3.7	.9
Clinical laboratory technologists and technicians	9	3.4	.6
Electrical and electronic technicians	8	2.6	.5
Chemical technicians	4	5.0	.3
Executive, administrative, and managerial occupations	134	1.2	8.5
Accountants and auditors	23	2.1	1.4

See footnote at end of table.

Table D-6. Continued—Occupational distribution of workers who used public post-high school vocational training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Administrators and officials, public administration	8	1.7	0.5
Personnel, training, and labor relations specialists	7	2.0	.4
Managers; marketing, advertising, and public relations	6	1.4	.4
Administrators, education and related fields	5	1.0	.3
Sales occupations	90	.8	5.7
Supervisors and proprietors, sales occupations	26	.9	1.6
Real estate sales occupations	24	5.1	1.5
Sales representatives; mining, manufacturing, wholesale trade	9	.7	.6
Cashiers	9	.5	.6
Machine operators, assemblers, and inspectors	79	1.1	5.0
Welders and cutters	27	5.1	1.7
Assemblers	13	1.4	.9
Printing machine operators	11	3.5	.7
Lathe and turning machine operators	6	7.6	.4
Handlers, equipment cleaners, helpers, and laborers	16	.4	1.0
Farming, forestry, and fishing occupations	16	.5	1.0
Farmers, except horticulture	8	.6	.5
Supervisors, related agricultural occupations	4	5.8	.3
Transportation and material moving occupations	10	.3	.6
Private household occupations	–	–	–

NOTE: Dash indicates that no data were reported. Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

Table D-7. Occupational distribution of workers who used informal on-the-job training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Total, all occupations	27,004	27.8	100.0
Administrative support occupations, including clerical	4,945	30.7	18.3
Secretaries	1,172	31.1	4.3
Bookkeepers, accounting and auditing clerks	721	36.1	2.7
Typists	246	29.0	.9
Computer operators	238	43.9	.9
Bank tellers	186	41.5	.7
Receptionists	165	26.7	.6
General office clerks	155	29.1	.6
Supervisors, general office	144	41.0	.5
Data entry keyers	124	41.4	.5
Stock and inventory clerks	123	22.8	.5
Investigators and adjusters, except insurance	113	40.7	.4
Order clerks	77	37.9	.3
Traffic, shipping, and receiving clerks	74	17.1	.3
Production coordinators	74	38.0	.3
Payroll and timekeeping clerks	72	35.5	.3
Insurance adjusters, examiners, and investigators	69	34.7	.3
Teacher aides	64	17.7	.2
Records clerks	58	28.6	.2
Billing clerks	50	28.3	.2
Postal clerks, except mail carriers	50	21.3	.2
File clerks	47	18.1	.2
Supervisors; distribution, scheduling, and adjusting clerks	47	27.3	.2
Dispatchers	45	30.4	.2
Precision production, craft, and repair occupations	4,710	40.3	17.4
Supervisors, production occupations	468	39.0	1.7
Carpenters	448	45.3	1.7
Automobile mechanics	299	38.2	1.1
Electricians	241	43.9	.9
Machinists	196	42.5	.7
Industrial machinery repairers	196	40.3	.7
Plumbers, pipefitters, and steamfitters	188	48.6	.7
Supervisors, mechanics and repairers	128	43.2	.5
Painters, construction and maintenance	120	35.5	.4
Bus, truck, and stationary engine mechanics	117	42.6	.4
Butchers and meat cutters	101	34.9	.4
Automobile body and related repairers	77	43.2	.3
Heating, air conditioning, and refrigeration mechanics	74	39.7	.3
Tool and die makers	72	43.8	.3
Telephone installers and repairers	70	27.1	.3
Heavy equipment mechanics	64	38.9	.2
Brickmasons and stonemasons	59	43.5	.2
Sheet-metal workers	56	43.2	.2
Inspectors, testers, and graders	51	37.6	.2
Electronic repairers, communication and industrial equipment	49	28.5	.2
Carpet installers	47	44.2	.2
Roofers	45	44.2	.2
Executive, administrative, and managerial occupations	4,242	30.2	15.7
Accountants and auditors	354	32.7	1.3
Managers; marketing, advertising, and public relations	208	45.9	.8
Financial managers	174	46.3	.6
Administrators and officials, public administration	153	35.0	.6
Personnel, training, and labor relations specialists	145	42.7	.5
Administrators, education and related fields	96	20.8	.4
Managers, properties and real estate	77	30.4	.3
Buyers, wholesale and retail trade, except farm products	69	33.2	.3
Management analysts	53	36.8	.2
Operations and systems researchers and analysts	47	34.4	.2
Inspectors and compliance officers, except construction	44	28.9	.2
Sales occupations	3,148	28.1	11.7
Supervisors and proprietors, sales occupations	957	34.5	3.5

See footnote at end of table.

Table D-7. Continued—Occupational distribution of workers who used informal on-the-job training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Sales representatives; mining, manufacturing, wholesale trade	485	37.5	1.8
Cashiers	428	21.9	1.6
Insurance sales occupations	214	38.7	.8
Real estate sales occupations	134	27.8	.5
Street and door-to-door sales workers	73	19.0	.3
Sales workers, apparel	70	17.3	.3
Securities and financial services sales occupations	63	33.6	.2
Sales workers, motor vehicles and boats	54	31.8	.2
Professional specialty occupations	2,767	21.7	10.2
Registered nurses	206	16.0	.8
Electrical and electronic engineers	139	31.8	.5
Designers	130	39.2	.5
Teachers, secondary school	127	9.6	.5
Teachers, elementary school	124	7.8	.5
Social workers	120	32.4	.4
Computer systems analysts and scientists	115	44.5	.4
Editors and reporters	113	52.6	.4
Lawyers	96	16.6	.4
Industrial engineers	96	41.0	.4
Mechanical engineers	70	31.8	.3
Clergy	65	21.3	.2
Teachers, prekindergarten and kindergarten	64	19.4	.2
Civil engineers	61	29.5	.2
Public relations specialists	56	47.6	.2
Librarians	54	25.7	.2
Photographers	52	42.1	.2
Painters, sculptors, craft-artists, and artist printmakers	48	33.0	.2
Musicians and composers	48	33.2	.2
Operations and systems researchers and analysts	47	34.4	.2
Economists	46	53.3	.2
Counselors, educational and vocational	45	25.9	.2
Service workers, except private household	2,233	18.0	8.3
Cooks, except short order	332	24.1	1.2
Nursing aides, orderlies, and attendants	324	26.1	1.2
Waiters and waitresses	265	21.0	1.0
Janitors and cleaners	159	8.3	.6
Guards and police, except public service	124	20.5	.5
Police and detectives, public service	102	26.9	.4
Health aides, except nursing	92	28.3	.3
Bartenders	90	29.6	.3
Supervisors, food preparation and service occupations	70	33.3	.3
Hairdressers and cosmetologists	64	10.8	.2
Childcare workers, except private household	61	9.4	.2
Dental assistants	50	37.7	.2
Maids and housemen	48	9.7	.2
Correctional institution officers	46	29.2	.2
Machine operators, assemblers, and inspectors	1,957	26.4	7.2
Textile sewing machine operators	197	25.9	.7
Welders and cutters	174	33.0	.6
Assemblers	172	17.7	.6
Production inspectors, checkers, and examiners	158	27.3	.6
Printing machine operators	116	38.4	.4
Paint and paint spray machine operators	57	30.7	.2
Photographic process machine operators	49	46.0	.2
Furnace, kiln, and oven operators, except food	49	38.4	.2
Winding and twisting machine operators	47	45.9	.2
Packaging and filling machine operators	44	12.2	.2
Transportation and material moving occupations	1,028	25.5	3.8
Truck drivers, heavy	404	25.4	1.5
Bus drivers	113	28.3	.4
Industrial truck and tractor equipment operators	83	23.8	.3
Truck drivers, light	55	13.1	.2

See footnote at end of table.

Table D-7. Continued—Occupational distribution of workers who used informal on-the-job training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Operating engineers	53	44.2	0.2
Driver-sales workers	46	21.7	.2
Crane and tower operators	43	46.2	.2
Technicians and related support occupations	962	31.6	3.6
Computer programmers	168	41.3	.6
Electrical and electronic technicians	116	39.1	.4
Drafting occupations	84	32.8	.3
Clinical laboratory technologists and technicians	69	25.4	.3
Licensed practical nurses	68	15.4	.3
Legal assistants	63	58.8	.2
Farming, forestry, and fishing occupations	507	16.4	1.9
Farmers, except horticultural	211	15.9	.8
Farm workers	104	12.0	.4
Groundskeepers and gardeners, except farm	46	13.8	.2
Handlers, equipment cleaners, helpers, and laborers	468	12.5	1.7
Laborers, except construction	120	12.9	.4
Stock handlers and baggers	75	10.1	.3
Construction laborers	67	15.4	.2
Private household occupations	36	3.7	.1

NOTE: Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

Table D-8. Occupational distribution of workers who used formal company training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Total, all occupations	9,418	9.7	100.0
Precision production, craft, and repair occupations	1,945	16.6	20.6
Electricians	174	31.6	1.8
Supervisors, production occupations	148	12.4	1.6
Plumbers, pipefitters, and steamfitters	119	30.9	1.3
Automobile mechanics	115	14.7	1.2
Machinists	108	23.5	1.1
Telephone installers and repairers	90	34.9	1.0
Industrial machinery repairers	86	17.8	.9
Carpenters	77	7.8	.8
Supervisors, mechanics and repairers	65	21.9	.7
Tool and die makers	57	35.1	.6
Inspectors, testers, and graders	43	31.9	.5
Butchers and meat cutters	39	13.5	.4
Painters, construction and maintenance	31	9.3	.3
Heating, air conditioning, and refrigeration mechanics	31	16.7	.3
Electronic repairers, communication and industrial equipment	30	17.4	.3
Data processing equipment repairers	30	30.5	.3
Office machine repairers	29	40.8	.3
Brickmasons and stonemasons	27	19.6	.3
Electrical power installers and repairers	26	24.3	.3
Telephone line installers and repairers	25	36.6	.3
Carpet installers	24	22.6	.3
Heavy equipment mechanics	22	13.6	.2
Bus, truck, and stationary engine mechanics	21	7.7	.2
Camera, watch, and music instrument repairers	20	37.1	.2
Millwrights	19	19.9	.2
Aircraft engine mechanics	19	19.9	.2
Structural metal workers	19	30.8	.2
Sheet-metal workers	17	13.2	.2
Stationary engineers	15	13.3	.2
Automobile body and related repairers	15	8.4	.2
Drywall installers	12	14.5	.1
Executive, adminstrative, and managerial occupations	1,346	12.4	14.3
Managers; marketing, advertising, and public relations	96	21.1	1.0
Accountants and auditors	90	8.3	1.0
Administrators and officials, public administration	63	14.5	.7
Financial managers	63	16.8	.7
Inspectors and compliance officers, except construction	37	24.5	.4
Personnel, training, and labor relations specialists	37	10.8	.4
Managers, medicine and health	21	17.5	.2
Managers, properties and real estate	17	6.7	.2
Administrators, education and related fields	16	3.5	.2
Management analysts	15	10.1	.2
Construction inspectors	14	20.6	.1
Buyers, wholesale and retail trade, except farm products	13	6.1	.1
Sales occupations	1,315	11.7	14.0
Supervisors and proprietors, sales occupations	310	11.2	3.3
Insurance sales occupations	231	41.9	2.5
Real estate sales occupations	179	37.0	1.9
Sales representatives; mining, manufacturing, wholesale trade	149	11.5	1.6
Cashiers	91	4.6	1.0
Securities and financial services sales occupations	71	37.6	.8
Street and door-to-door sales workers	43	11.1	.4
Sales workers; radio, TV, hi-fi, and appliances	19	13.7	.2
Advertising and related sales occupations	16	12.6	.2
Sales workers, hardware and building supplies	15	7.6	.2
Sales engineers	15	27.3	.2
Sales workers, motor vehicles and boats	14	8.6	.2
Administrative support occupations, including clerical	1,198	7.4	12.7
Secretaries	151	4.0	1.6
Bookkeepers, accounting and auditing clerks	97	4.8	1.0

See footnote at end of table.

Table D-8. Continued—Occupational distribution of workers who used formal company training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Computer operators	84	15.4	0.9
Bank tellers	77	17.2	.8
Supervisors, general office	58	16.5	.6
Insurance adjusters, examiners, and investigators	50	25.0	.5
Investigators and adjusters, except insurance	49	17.5	.5
Telephone operators	46	19.7	.5
Typists	43	5.1	.5
Data-entry keyers	43	14.4	.5
Receptionists	31	5.1	.3
Transportation ticket and reservation agents	30	27.0	.3
Order clerks	30	15.0	.3
General office clerks	29	5.5	.3
Postal clerks, except mail carriers	29	12.2	.3
Teacher aides	27	7.4	.3
Records clerks	23	11.5	.2
Stock and inventory clerks	19	3.6	.2
Mail carriers, postal service	17	6.5	.2
Interviewers	16	10.6	.2
Production coordinators	15	7.9	.2
Billing clerks	13	7.6	.1
Supervisors; distribution, scheduling, and adjusting clerks	13	7.3	.1
Mail clerks, except postal service	12	7.2	.1
Professional specialty occupations	1,184	9.3	12.6
Registered nurses	185	14.4	2.0
Electrical and electronic engineers	77	17.7	.8
Computer systems analysts and scientists	69	26.6	.7
Teachers, elementary school	66	4.2	.7
Teachers, secondary school	61	4.6	.6
Physicians	58	11.8	.6
Social workers	41	11.2	.4
Operations and systems researchers and analysts	41	30.0	.4
Clergy	41	13.3	.4
Industrial engineers	35	14.9	.4
Designers	31	9.2	.3
Mechanical engineers	27	12.3	.3
Lawyers	20	3.5	.2
Teachers, prekindergarten and kindergarten	18	5.6	.2
Aerospace engineers	17	17.6	.2
Photographers	16	12.8	.2
Editors and reporters	14	6.6	.2
Architects	13	13.4	.1
Service occupations	1,104	8.9	11.7
Nursing aides, orderlies, and attendants	220	17.7	2.3
Police and detectives, public service	183	48.3	1.9
Hairdressers and cosmetologists	132	22.3	1.4
Guards and police, except public service	73	12.1	.8
Firefighting occupations	69	40.7	.7
Correctional institution officers	60	38.3	.6
Cooks, except short order	41	2.9	.4
Sheriffs, bailiffs, and other law enforcement officers	36	37.5	.4
Childcare workers, except private household	27	4.2	.3
Janitors and cleaners	27	1.4	.3
Supervisors, food preparation and service occupations	24	11.3	.3
Waiters and waitresses	24	1.9	.3
Health aides, except nursing	23	7.0	.2
Bartenders	12	3.9	.1
Machine operators, assemblers, and inspectors	476	6.4	5.1
Welders and cutters	87	16.5	.9
Production inspectors, checkers, and examiners	48	8.3	.5
Assemblers	42	4.3	.4
Printing machine operators	36	11.8	.4
Textile sewing machine operators	18	2.4	.2

See footnote at end of table.

Table D-8. Continued—Occupational distribution of workers who used formal company training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Photographic process machine operators	14	13.3	0.1
Technicians and related support occupations	422	13.8	4.5
Computer programmers	78	19.1	.8
Licensed practical nurses	60	13.6	.6
Electrical and electronic technicians	55	18.5	.6
Radiologic technicians	25	23.6	.3
Clinical laboratory technologists and technicians	24	8.6	.2
Drafting occupations	23	9.0	.2
Transportation and material moving occupations	311	7.7	3.3
Bus drivers	124	31.0	1.3
Truck drivers, heavy	71	4.5	.8
Industrial truck and tractor equipment operators	20	5.7	.2
Locomotive operating occupations	13	23.9	.1
Handlers, equipment cleaners, helpers, and laborers	68	1.8	.7
Laborers, except construction	15	1.6	.2
Farming, forestry, and fishing occupations	41	1.3	.4
Private household occupations	10	1.0	.1

NOTE: Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

Table D-9. Occupational distribution of workers who used Armed Forces training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Total, all occupations	1,902	2.0	100.0
Precision production, craft, and repair occupations	599	5.1	31.5
Electricians	66	12.0	3.5
Supervisors, production occupations	53	4.4	2.8
Automobile mechanics	47	5.9	2.4
Aircraft engine mechanics	43	44.8	2.3
Electronic repairers, communication and industrial equipment	37	21.4	1.9
Supervisors, mechanics and repairers	33	11.1	1.7
Industrial machinery repairers	27	5.5	1.4
Bus, truck, and stationary engine mechanics	24	8.7	1.2
Data processing equipment repairers	21	22.1	1.1
Machinists	21	4.6	1.1
Telephone installers and repairers	18	6.9	.9
Carpenters	14	1.4	.7
Heating, air conditioning, and refrigeration mechanics	14	7.5	.7
Plumbers, pipefitters, and steamfitters	13	3.4	.7
Sheet metal workers	10	7.8	.5
Stationary engineers	9	7.8	.5
Electrical power installers and repairers	8	7.7	.4
Office machine repairers	8	11.4	.4
Inspectors, testers, and graders	7	5.4	.4
Telephone line installers and repairers	7	10.1	.4
Executive, administrative, and managerial occupations	314	2.9	16.5
Accountants and auditors	22	2.0	1.1
Administrators and officials, public administration	20	4.6	1.1
Personnel, training, and labor relations specialists	16	4.8	.9
Managers; marketing, advertising, and public relations	14	3.1	.7
Inspectors and compliance officers, except construction	13	8.5	.7
Management analysts	9	5.3	.5
Construction inspectors	8	11.5	.4
Personnel and labor relations managers	7	6.4	.4
Professional specialty occupations	281	2.2	14.8
Electrical and electronic engineers	38	8.6	2.0
Teachers, secondary school	26	2.0	1.4
Industrial engineers	18	7.7	.9
Registered nurses	15	1.2	.8
Aerospace engineers	14	14.5	.7
Physicians	13	2.6	.7
Editors and reporters	12	5.8	.7
Computer systems analysts and scientists	12	4.6	.6
Operations and systems researchers and analysts	10	7.5	.5
Mechanical engineers	10	4.4	.5
Dentists	8	6.1	.4
Technicians and related support occupations	152	5.0	8.0
Electrical and electronic technicians	51	17.2	2.7
Computer programmers	10	2.5	.5
Drafting occupations	7	2.6	.4
Service workers, except private household	141	1.1	7.4
Guards and police, except public service	42	7.0	2.2
Police and detectives, public service	25	6.5	1.3
Cooks, except short order	16	1.1	.8
Sheriffs, bailiffs, and other law enforcement officers	9	9.0	.5
Firefighting occupations	9	5.0	.5
Administrative support occupations, including clerical	136	.8	7.1
Stock and inventory clerks	21	4.0	1.1
Secretaries	15	.4	.8
Investigators and adjusters, except insurance	13	4.5	.7
Computer operators	9	1.6	.5
Supervisors, general office	9	2.5	.5
Mail carriers, postal service	8	3.2	.4

See footnote at end of table.

Table D-9. Continued—Occupational distribution of workers who used Armed Forces training to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Sales occupations	90	0.8	4.7
Supervisors and proprietors, sales occupations	90	.8	4.7
Sales representatives; mining, manufacturing, wholesale trade	17	1.3	.9
Machine operators, assemblers, and inspectors	81	1.1	4.3
Welders and cutters	17	3.3	.9
Production inspectors, checkers, and examiners	15	2.5	.8
Furnace, kiln, and oven operators, except food	9	7.3	.5
Assemblers	7	.8	.4
Transportation and material moving occupations	80	2.0	4.2
Truck drivers, heavy	41	2.6	2.2
Bus drivers	9	2.4	.5
Crane and tower operators	7	7.3	.4
Handlers, equipment cleaners, helpers, and laborers	20	.5	1.1
Laborers, except construction	7	.7	.4
Farming, forestry, and fishing occupations	7	.2	.3
Private household occupations	–	–	–

NOTE: Dash indicates that no data were reported. Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

Table D-10. Occupational distribution of workers who used training from correspondence courses to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Total, all occupations	777	0.8	100.0
Precision production, craft, and repair occupations	188	1.6	24.2
Electronic repairers, communications and industrial equipment	21	12.4	2.8
Supervisors, production occupations	14	1.2	1.9
Supervisors, mechanics and repairers	13	4.3	1.7
Electricians	11	2.0	1.4
Telephone installers and repairers	9	3.3	1.1
Stationary engineers	8	7.5	1.1
Plumbers, pipefitters, and steamfitters	8	2.0	1.0
Automobile mechanics	6	.8	.8
Supervisors, extractive occupations	6	7.8	.8
Heating, air conditioning, and refrigeration mechanics	6	3.0	.7
Aircraft engine mechanics	5	5.5	.7
Carpenters	5	.5	.6
Inspectors, testers, and graders	4	3.3	.6
Machinists	3	.8	.4
Upholsterers	3	5.3	.4
Millwrights	3	3.9	.4
Data processing equipment repairers	3	3.4	.4
Executive, administrative, and managerial occupations	140	1.3	18.0
Administrators and officials, public administration	17	3.8	2.1
Managers; marketing, advertising, and public relations	10	2.3	1.3
Accountants and auditors	10	.9	1.3
Financial managers	4	1.1	.5
Professional specialty occupations	118	.9	15.2
Electrical and electronic engineers	19	4.3	2.4
Teachers, secondary school	18	1.4	2.3
Teachers, elementary school	8	.5	1.0
Industrial engineers	7	3.1	.9
Clergy	7	2.3	.9
Designers	7	2.1	.9
Mechanical engineers	6	2.8	.8
Civil engineers	5	2.6	.7
Counselors, educational and vocational	4	2.5	.6
Painters, sculptors, craft-artists, and artist printmakers	4	2.5	.5
Photographers	4	2.9	.5
Sales occupations	113	1.0	14.5
Insurance sales occupations	33	6.0	4.2
Supervisors and proprietors, sales occupations	30	1.1	3.8
Securities and financial services sales occupations	14	7.4	1.8
Sales representatives; mining, manufacturing, wholesale trade	9	.7	1.2
Real estate sales occupations	9	1.8	1.1
Street and door-to-door sales workers	3	.7	.3
Administrative support occupations, including clerical	101	.6	13.0
Secretaries	20	.5	2.6
Bookkeepers, accounting and auditing clerks	12	.6	1.6
Investigators and adjusters, except insurance	12	4.3	1.5
Stock and inventory clerks	9	1.7	1.2
Supervisors; general office	5	1.5	.7
Typists	5	.6	.6
Supervisors, distribution, scheduling, and adjusting clerks	4	2.3	.5
General office clerks	3	.6	.4
Postal clerks, except mail carriers	2	1.0	.3
Technicians and related support occupations	54	1.8	7.0
Electrical and electronic technicians	20	6.7	2.6
Drafting occupations	8	3.2	1.0
Computer programmers	2	.6	.3

See footnote at end of table.

Table D-10. Continued—Occupational distribution of workers who used training from correspondence courses to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Service workers, except private household	23	1.8	2.9
Nursing aides, orderlies, and attendants	6	.5	.7
Supervisors, food preparation and service occupations	5	2.4	.6
Guards and police, except public service	4	.7	.5
Janitors and cleaners	3	.2	.4
Machine operators, assemblers, and inspectors	22	.3	2.8
Welders and cutters	6	1.2	.8
Paint and paint spray machine operators	5	2.6	.6
Transportation and material moving occupations	7	.2	.9
Truck drivers, heavy	3	.2	.3
Handlers, equipment cleaners, helpers, and laborers	7	.2	.9
Construction laborers	2	.5	.3
Laborers, except construction	2	.2	.3
Farming, forestry, and fishing occupations	5	.2	.7
Farmers, except horticulture	5	.4	.7
Private household occupations	–	–	–

NOTE: Dash indicates that no data were reported. Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

Table D-11. Occupational distribution of workers who used training from friends or relatives or other experience unrelated to work to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Total, all occupations	3,205	3.3	100.0
Precision production, craft, and repair occupations	939	8.0	29.3
Carpenters	174	17.6	5.4
Automobile mechanics	120	15.3	3.7
Bus, truck, and stationary engine mechanics	36	13.2	1.1
Plumbers, pipefitters, and steamfitters	35	9.0	1.1
Dressmakers	34	31.6	1.1
Industrial machinery repairers	33	6.9	1.0
Automobile body and related repairers	30	17.0	.9
Electricians	30	5.4	.9
Supervisors, production occupations	25	2.1	.8
Painters, construction and maintenance	24	7.0	.7
Machinists	20	4.3	.6
Heavy equipment mechanics	16	9.6	.5
Heating, air conditioning, and refrigeration mechanics	15	7.9	.5
Brickmasons and stonemasons	15	10.8	.5
Electronic repairers, communication and industrial equipment	11	6.3	.3
Drywall installers	11	12.8	.3
Butchers and meat cutters	10	3.5	.3
Carpet installers	10	9.3	.3
Aircraft engine mechanics	10	9.9	.3
Camera, watch, and instrument repairers	9	16.5	.3
Supervisors, mechanics and repairers	9	2.9	.3
Roofers	8	8.3	.3
Bakers	8	6.2	.2
Upholsterers	7	10.7	.2
Tool and die makers	6	3.4	.2
Inspectors, testers, and graders	5	3.6	.2
Office machine repairers	4	6.1	.1
Executive, administrative, and managerial occupations	341	3.1	10.6
Managers, properties and real estate	13	5.1	.4
Administrators and officials, public administration	13	2.9	.4
Managers; marketing, advertising, and public relations	9	2.0	.3
Financial managers	8	2.1	.2
Accountants and auditors	7	.6	.2
Personnel and labor relations managers	6	5.5	.2
Buyers, wholesale and retail trade, except farm products	6	2.9	.2
Inspectors and compliance officers, except construction	4	2.8	.1
Business and promotion agents	4	6.6	.1
Personnel, training, and labor relations specialists	4	1.1	.1
Administrators, education and related fields	4	.8	.1
Construction inspectors	3	5.1	.1
Farming, forestry, and fishing occupations	335	10.8	10.4
Farmers, except horiculture	204	15.4	6.4
Farm workers	59	6.8	1.8
Groundskeepers and gardeners, except farm	30	9.0	.9
Animal caretakers, except farm	11	9.9	.4
Fishers	6	11.8	.2
Supervisors, related agricultural occupations	6	7.2	.2
Timber cutting and logging occupations	4	5.0	.1
Professional specialty occupations	331	2.6	10.3
Musicians and composers	38	26.4	1.2
Designers	29	8.7	.9
Photographers	25	20.4	.8
Teachers, secondary school	23	1.7	.7
Athletes	14	25.4	.4
Electrical and electronic engineers	13	3.0	.4
Teachers, elementary school	13	.8	.4
Painters, sculptors, craft-artists, and artist printmakers	10	6.8	.3
Clergy	8	2.7	.3
Public relations specialists	8	6.4	.2

See footnote at end of table.

Table D-11. Continued—Occupational distribution of workers who used training from friends or relatives or other experience unrelated to work to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Civil engineers	7	3.6	0.2
Teachers, prekindergarten and kindergarten	7	2.2	.2
Psychologists	6	5.2	.2
Social workers	6	1.7	.2
Computer systems analysts and scientists	6	2.4	.2
Registered nurses	5	.4	.2
Counselors, education and vocational	4	2.5	.1
Authors	4	6.5	.1
Aerospace engineers	4	4.0	.1
Sales occupations	330	2.9	10.3
Supervisors and proprietors, sales occupations	120	4.3	3.7
Sales representatives; mining, manufacturing, wholesale trade	47	3.6	1.5
Insurance sales occupations	19	3.5	.6
Sales workers; radio, TV, hi-fi, and appliances	11	8.2	.4
Cashiers	11	.5	.3
Sales workers, hardware and building supplies	10	5.2	.3
Sales workers, parts	10	6.6	.3
Street and door-to-door sales workers	8	2.2	.3
Sales workers, furniture and home furnishings	8	5.0	.2
Sales workers, apparel	7	1.6	.2
Real estate sales occupations	7	1.4	.2
Securities and financial services sales occupations	6	3.0	.2
Sales workers, motor vehicles and boats	4	2.2	.1
Service workers, except private household	216	1.7	6.7
Cooks, except short order	48	3.5	1.5
Janitors and cleaners	31	1.6	1.0
Child care workers, except private household	19	2.9	.6
Waiters and waitresses	18	1.4	.6
Attendants, amusement and recreation facilities	13	11.1	.4
Nursing aides, orderlies, and attendants	11	.9	.3
Barbers	7	6.2	.2
Guards and police, except public service	7	1.1	.2
Supervisors, food preparation and service occupations	6	3.1	.2
Bartenders	6	2.1	.2
Health aides, except nursing	5	1.5	.2
Hairdressers and cosmetologists	4	.8	.1
Firefighting occupations	4	2.4	.1
Police and detectives, public service	4	1.0	.1
Administrative support occupations, including clerical	198	1.2	6.2
Secretaries	55	1.5	1.7
Bookkeeping, accounting, and auditing clerks	37	1.9	1.2
Teacher aides	12	3.3	.4
General office clerks	9	1.7	.4
Computer operators	7	1.4	.2
Typists	7	.8	.2
Supervisors, general office	6	1.7	.2
Receptionists	6	.9	.2
Traffic, shipping, and receiving clerks	4	1.0	.1
Bank tellers	4	.9	.1
Investigators and adjusters, except insurance	4	1.5	.1
Stenographers	4	3.7	.1
Machine operators, assemblers, and inspectors	186	2.5	5.8
Textile sewing machine operators	42	5.5	1.3
Welders and cutters	37	7.0	1.1
Paint and paint spray machine operators	14	7.7	.4
Printing machine operators	10	3.4	.3
Assemblers	9	.9	.3
Photographic process machine operators	7	6.3	.2
Laundry and dry cleaning machine operators	6	3.0	.2

See footnote at end of table.

Table D-11. Continued—Occupational distribution of workers who used training from friends or relatives or other experience unrelated to work to qualify for their jobs, 1983

Occupation	Number who used the training (thousands)	Percent of—	
		Total employment in occupation	Total who used the training
Typesetters and compositors	4	5.5	0.1
Slicing and cutting machine operators	3	1.7	.1
Transportation and material moving occupations	185	4.6	5.8
Truck drivers, heavy	113	7.1	3.5
Bus drivers	16	4.0	.5
Truck drivers, light	14	3.4	.4
Driver-sales workers	5	2.6	.2
Excavating and loading machine operators	5	5.0	.1
Operating engineers	4	3.3	.1
Crane and tower operators	4	4.0	.1
Industrial truck and tractor equipment operator	4	1.1	.1
Taxicab drivers and chauffeurs	4	1.9	.1
Handlers, equipment cleaners, helpers, and laborers	54	1.4	1.7
Construction laborers	17	3.8	.5
Laborers, except construction	14	1.5	.4
Vehicle washers and equipment cleaners	7	4.8	.2
Helpers, construction trades	6	4.0	.2
Technicians and related support occupations	47	1.5	1.5
Drafting occupations	9	3.5	.3
Computer programmers	6	1.5	.2
Biological technicians	6	10.1	.2
Electrical and electronic technicians	5	1.8	.2
Private household occupations	45	4.6	1.4
Childcare workers, private household	33	7.6	1.0
Private household cleaners and servants	10	2.1	.3

NOTE: Percentages are based on unrounded numbers. Because of rounding, individual items may not add to totals.

Appendix E. Detailed Training Statistics

This appendix presents information on one component of supply—structured training programs. It discusses the status of education and training programs and provides the latest available data on enrollments and completions. The type of data presented and the time period covered vary. Training programs discussed and available data presented include:

Public vocational education (table E-1)
Noncollegiate postsecondary vocational education (table E-2)
Employer training
Apprenticeship programs
Federal employment and training programs
Armed Forces training (table E-3)
Home study schools
Community and junior colleges (table E-4)
Colleges and universities (tables E-5 and E-6)

Users who wish to relate educational and occupational classifications should consult *Vocational Preparation and Occupations* (VPO), developed by the National Occupational Information Coordinating Committee (NOICC). This crosswalk is maintained in a computerized data base and updated periodically. Education programs in the VPO are coded according to the *Classification of Instructional Programs* (CIP)[1], developed by the National Center for Education Statistics (NCES). It replaces the two NCES classification systems that were used previously—the *Standard Terminology for Curriculum and Instruction in Local and State School Systems,* commonly referred to as Handbook VI, and *A Taxonomy of Instructional Programs in Higher Education,* commonly known as the HEGIS Taxonomy. Information on the VPO is available from NOICC, (202) 653-5665.

Public vocational education

Vocational education programs are conducted on both the secondary and postsecondary levels. Included in the postsecondary level are adult education programs, in which persons—many already in the labor force—retrain or update and improve their job skills. Federal Government funding currently takes the form of block grants to the States (for discretionary use) to administer manyof these programs. States in the past have strongly supported vocational education programs and are likely to continue this policy.

Types of training available. Vocational education includes programs in agriculture, distribution, health, home economics, business and office, technical, and trade and industrial education. Other programs, such as consumer and homemaking training and industrial arts, do not generally lead directly to an occupational skill. Special vocational programs for the disadvantaged and handicapped also are provided.

Curriculums generally prepare trainees for specific occupations. Table E-1 provides data on enrollments and completions in occupationally specific public vocational education programs during 1982-83. These programs, which are offered at or above grade 11, are designed to impart entry level job skills.

Enrollments. Total enrollments in public vocational education programs grew from 12.3 million in 1972-73 to 19 million in 1982-83. Occupationally specific enrollments, which totaled nearly 6 million in 1982-83, accounted for 31 percent of all public vocational education enrollments. About 38 percent of the occupationally specific enrollments were in business and office programs, and 25 percent were in trade and industrial programs (table E-1).

Noncollegiate postsecondary vocational education

Over 1.5 million persons were enrolled in nearly 6,500 noncollegiate postsecondary schools with occupational programs during the year ended June 30, 1981, the most recent year for which data are available. The following tabulation shows the distribution of these schools by type of school:

School	*Percent*
Cosmetology/barber	34
Business/commercial	20
Trade	12
Hospital	12
Vocational/technical	10
Allied health	6
Arts/design	4
Technical	2

[1] The VPO includes only codes related to secondary and postsecondary vocational education. Baccalaureate and higher level programs are not included.

Of the more than 6,000 noncollegiate postsecondary schools included here, 75 percent were proprietary schools, 12 percent were independent nonprofit schools, and 13 percent were public schools. Over 70 percent of the proprietary schools were either cosmetology/barber schools or business/commercial schools. Hospital schools made up 75 percent of the independent nonprofit schools, and vocational/technical institutes accounted for over 70 percent of the public schools.

Large schools typically offer a variety of programs in several vocational areas. Some business schools, for example, offer shorthand, typing, stenography, and fundamentals of accounting and computer operations, while many trade schools offer courses ranging from air-conditioning installation and repair to welding and cutting operations. On the other hand, small schools generally specialize in a single type of program, such as cosmetology or radiologic technology. Some programs—flight training, for instance—require considerable individual attention and generally have low pupil/teacher ratios; less technically complex programs—real estate, for example—can accommodate large numbers of students.

Enrollments. Enrollments in noncollegiate postsecondary schools vary considerably by program. The seven major program areas are: Agribusiness, marketing and distribution, health, home economics, technical, business and office, and trade and industrial. In 1981, 40 percent of total enrollments were in trade and industrial programs, 24 percent were in business/office programs, and 16 percent were in marketing and distribution programs (table E-2).

Completions. Almost 900,000 persons completed occupational programs in noncollegiate postsecondary schools in 1981. Approximately 40 percent were in trade and industrial programs; 22 percent were in marketing/distribution; and 20 percent were in business/office programs. Almost 100,000 students did not complete their training but left with a marketable job skill. Table E-2 provides complete information on enrollments, completions, and persons leaving with or without a marketable job skill, by detailed occupational program.

Employer training

Many companies in private industry have developed their own educational training programs. Generally, these programs serve three purposes: (1) To train new employees, (2) to improve the performance of employees in their present jobs, and (3) to prepare employees for new jobs and responsibilities.

Training varies among occupations. Skilled and semiskilled occupations have three on-the-job training paths—apprenticeship, learning by doing, and structured on-the-job instruction. Formal apprenticeship programs are discussed in the following section. Unstructured training or learning by doing often involves simple directions for performing a routine task on a machine; further skills then are acquired through work experience or developed at the employee's initiative. Structured instruction may range from scheduled training conducted by designated instructors to periodic training from supervisors and fellow employees.

In many companies, structured training usually consists of "in-house" programs that offer courses during or after working hours. These courses normally are designed to meet specific company needs and often are offered by professional associations. In the banking industry, for example, the American Institute of Banking offers programs in 19 areas of banking, such as trusts, commercial lending, and bank marketing.

In addition, companies may allow employees to enroll in college or university courses. For example, under tuition-aid programs, employees may be partially or fully reimbursed for job-related courses taken after working hours. Occasionally, employees are permitted to take outside courses on company time or even to arrange for extended educational leaves of absence.

Studies indicate that companies use education and training programs extensively. For example, a recent study conducted by the American Society for Training and Development estimates that 13 million, or 1 of every 8, workers are receiving job-related training. Almost two-thirds of these training programs are provided in house and the remainder are offered by colleges and universities, vocational schools, labor unions, government agencies, and community-based organizations.[2]

Apprenticeship programs

Training authorities generally recommend apprenticeship as the best way to acquire all-round proficiency in a craft. Apprenticeships range from 1 to 6 or more years, depending upon the trade. These programs involve planned on-the-job training in conjunction with related classroom instruction—generally 144 hours each year. Mastery of a particular trade requires: (1) Learning the skills of the trade, (2) perfecting the use of each specific skill, and (3) bringing each skill up to the level of competency and productivity required for the occupation.

Most apprentices are in programs that have committees of employers and local trade unions that interview applicants, review the apprentice's progress, and determine when an apprenticeship has been completed satisfactorily. It has been estimated that only about one-half of all programs are registered with Federal and State apprenticeship agencies. Unfortunately, no estimate is available of the number of apprentices in programs that are not registered.

[2]Anthony Carnevale and Harold Goldstein, *Employee Training: Its Changing Role and An Analysis of New Data* (The American Society for Training and Development, 1983).

The Department of Labor's Bureau of Apprenticeship and Training (BAT) registers, but does not finance apprenticeship programs. BAT provides technical assistance and support to State apprenticeship agencies and to employers and unions in establishing and maintaining apprenticeship programs. Data on new registrations, completions, and cancellations of apprenticeships for each apprenticeable trade are available through the Apprenticeship Management System (AMS).[3]

Although apprenticeship cancellations represent a potential loss of highly trained workers, many who do not complete an apprenticeship program eventually become skilled craft workers through less structured means. When the job market is depressed, however, workers are more likely to complete their apprenticeship. In other instances, apprentices who cancel may have acquired enough experience to reenter the occupation at another time. Apprentices sometimes are dropped involuntarily for noncompliance with the terms of the apprenticeship agreement. In addition, the number of new apprentices often is reduced during prolonged periods of economic slowdown or high unemployment.

Federal employment and training programs

The Job Training Partnership Act (JTPA) of 1982 relies on the private sector—through local Private Industry Councils (PIC's)—to plan, organize, dispense funds for, and evaluate the success of employment and training programs within their jurisdiction. JTPA focuses on training the economically disadvantaged as well as displaced workers—those long attached to the labor force who have been laid off permanently from their jobs and who need assistance to regain employment through training, job search, and job relocation.

JTPA also provides for two specific youth programs: (1) The Job Corps[4], with over 100 centers throughout the United States that annually assist nearly 88,000 young men and women ages 16 to 21 to learn a job skill or obtain the educational base needed to advance in society; and (2) the Summer Youth Employment Program, that annually provides approximately 800,000 temporary summer jobs in city, county, and State government agencies.

Other Federal programs administered by the Employment and Training Administration include the following: The Trade Adjustment Act program, which assists workers who have lost their jobs due to foreign competition; the Work Incentive (WIN) program, which helps employable recipients of Aid to Families with Dependent Children to get and keep jobs; occupational, social, and educational assistance provided to migrant and seasonal farm workers; help for workers 55 and older to get part-time jobs and social services; and a variety of training and aid programs that are designed to benefit Native Americans.

Armed Forces training

The Armed Forces provide training in hundreds of specialized occupational skills. Each year, thousands of military recruits complete extensive training in computer repair, medical care, food service, metalworking, and many other fields. When these persons leave military service, they often possess skills that qualify them for civilian occupations.

Some military occupations are not directly comparable to civilian ones or are specific only to the needs of the Armed Forces. Individuals in these fields may need additional training after they leave the service to qualify for civilian jobs that are similar to their military jobs. For example, an electrician's mate may have many, but not all, of the skills needed to become an electronics technician. A few military skills, such as those learned by infantry specialists, are unique to the Armed Forces and have limited or no application to civilian jobs.

To assist military personnel in utilizing their training to qualify for civilian jobs, the Army, Navy, and Marine Corps, in concert with the Bureau of Apprenticeship and Training, have established registered apprenticeship programs for uniformed personnel. Only occupations that are comparable or identical to civilian occupations are registered. Individuals participating in a program record their hours of training and work assignments in a logbook that documents their service experience and which can be presented to an employer, labor union, or joint apprenticeship committee when they apply for a job.

The largest proportion of Armed Forces enlistees train in the mechanical and technical areas. The following tabulation shows the number of enlisted personnel in each of the nine major occupational groups as of June 30, 1985:

Occupational group	*Number (in thousands)*
Infantry, guncrew, and seamanship specialists	266
Electronic equipment repairers	174
Communications and intelligence specialists	177
Medical and dental specialists	89
Other technical and allied specialists	44
Functional support and administration	292
Electrical and mechanical equipment repairers	370
Craft workers	77
Service and supply handlers	175

[3] *Apprenticeship Registration Actions, by Region and State* may be obtained from the Bureau of Apprenticeship and Training, Employment and Training Administration, U.S. Department of Labor, Washington, D.C. 20213.

[4] Data on the number of persons who have completed a training program or left with a marketable skill—by program category and State—are available from the National Occupational Information Coordinating Committee (NOICC), Suite 156, 2100 M Street NW., Washington, D.C. 20037 (202) 653-5665.

Table E-3 provides more detail on these occupational groups.

To aid in "translating" military job titles, the Department of Defense has compiled a job comparability manual. The *Military-Civilian Occupational Source Book* relates military jobs by service branch to their civilian counterparts as identified in the Department of Labor's *Dictionary of Occupational Titles*. Although intended for use by high school guidance counselors, the manual can also serve as a useful tool for employees and vocational counselors involved in job placement for veterans.

Home study schools

Home study (correspondence) schools provide an alternative means of education and training for many individuals who are unable to attend school. Courses offered through home study programs vary in length, skill level, and degree of specialization, and emphasize vocational training, academic study, or simply personal enrichment.

In 1984, about 5.1 million persons were enrolled in home study courses, according to the National Home Study Council (NHSC). Enrollment in Federal Government and military programs totaled 2.5 million; 1.7 million students took courses offered by private schools; and most of the remaining home study students were enrolled in programs offered by religious organizations, colleges and universities, and industry.

Correspondence schools generally require students to complete a certain number of lessons within a specified length of time to obtain a certificate of completion.

A rapidly expanding area of home study is electronic media courses. These are usually developed by a college or university and broadcast over a local Public Broadcasting System (PBS) or cable television station. Course offerings and requirements vary, but most allow the student to receive college credit after successfully completing the television course.

Since 1981, approximately 900 colleges and universities and 290 stations have participated in this type of program. Because of the convenience it offers, this method of home study has attracted over 330,000 students since 1981. During the 1984-85 academic year alone, 130,000 people were enrolled.

In view of the popularity of this method of instruction, the Adult Learning Service of PBS plans to initiate more programming aimed toward education and training. Proposed areas include: Computer literacy and applications, basic skills and personal enrichment, sales and customer service, effective communication skills, and management skills. More information regarding these programs can be obtained by contacting the Adult Learning Liaison at any PBS Station.

Community and junior colleges

Community and junior colleges are an integral part of the American educational system. By offering a wide variety of courses and programs, these schools enable many students from diverse backgrounds to obtain occupational and educational training beyond high school. For students interested in transferring to a 4-year college, many programs are designed to provide a general educational background in arts and sciences. Students who wish to specialize in a particular field may enroll in vocational or occupational curriculums, such as dental hygiene or data processing. Some community and junior colleges have expanded their curriculums to include televised courses. More information about these programs is available in the section on home study schools above. Typically, programs in junior and community colleges last 2 years and lead to an associate degree. Some programs last less than 2 years and students are granted certificates or other formal awards upon completion.

According to the NCES, enrollments in 2-year institutions of higher education grew rapidly over the 1973-83 period—from 3.0 million to 4.7 million. NCES projects that enrollments in 2-year institutions will remain at their current level through the early 1990's.

During the 1973-83 period, awards of associate degrees increased 43 percent, according to recent surveys.[5] A shift in student attitudes, placing more value on job training, was apparently a factor in the upsurge in associate degrees awarded. Associate degrees in occupational curriculums grew 73 percent over the 1973-83 period, while degrees in the arts and sciences increased 15 percent during the same period. In academic year 1982-83, 59 percent of all associate degrees were awarded in occupational curriculums, while 41 percent were awarded in arts and sciences and general programs. Table E-4 provides detailed data for the academic year 1982-83 on associate degrees and other formal awards below the baccalaureate.

Because community and junior colleges can quickly adjust their programs to the needs of local employers as well as to student interests, radical changes in enrollments in particular curriculums can and do take place in a short time. For this reason, NCES does not project the number of enrollments in specific curriculums. Information on curriculum plans may be obtained from State and local community and junior college administrators.

Colleges and universities

Colleges and universities serve many purposes, including providing individuals with specific occupational

[5] The Higher Education General Information Survey (HEGIS) of NCES provides annual data on associate degrees and other awards below the baccalaureate, including those granted by 4-year colleges.

training. A college education provides the necessary background to enter fields such as engineering, law, business, the humanities, and the natural sciences.

In recent years, colleges and universities have adopted new methods to attract more students. Expanded part-time programs, additional evening course offerings, extension programs, and "telecourses" are means by which many of these institutions are making education more accessible. For more information regarding "telecourses," see the section of this appendix on home study schools.

The length of a college education depends on the student's interests and career goals. Most students seek employment after obtaining a bachelor's degree, which usually requires 4 years. Those who wish to qualify for a position requiring more specialized knowledge often continue their study. Master's, doctoral, and first professional degree programs require several additional years of study after the bachelor's degree. Occasionally, these programs accept exceptional students after 2 or 3 years of undergraduate work.

College and university enrollments increased steadily during the 1960's and early 1970's—from 4.8 million in 1964-65 to 7.2 million in 1974-75. The rate of increase slowed during the late 1970's—to 7.7 million by 1981-82. The NCES projects that enrollments will slowly decline to 7.4 million by 1985-86 and continue downward to an expected enrollment of 7.1 million by 1992.

The number of degrees conferred by colleges and universities is closely related to enrollments. During academic year 1982-83, nearly 1.4 million persons earned degrees—970,000 bachelor's degrees, 290,000 master's degrees, 33,000 doctoral degrees, and 73,000 first professional degrees. NCES projects that the total number of degrees earned will decrease to 1.3 million in academic year 1986-87, then taper off to 1.2 million by 1992-93.[6]

Tables E-5 and E-6 show the number of degrees conferred by major field of study. Although many graduates do not pursue careers in their field of study, the proportion of graduates of occupational curriculums who directly enter related occupations tends to be very high, particularly if training takes a number of years. For example, nearly all medical school graduates enter medicine and most engineering school graduates enter engineering. However, for many liberal arts graduates, whose training is less occupationally oriented, entry rates into occupations related to a college major are substantially lower. This is especially true at the bachelor's degree level since many graduates enter professional school, teaching, or occupations for which a college degree in any one of a number of fields may be adequate preparation.

The NCES periodically collects and publishes data on the labor force status of people who have recently received a bachelor's degree. The Bureau of Labor Statistics has analyzed these data for all graduates and for each of 20 major fields of study. Information on the labor force, occupational, and graduate school status of each of these groups will be presented in a forthcoming issue of the *Occupational Outlook Quarterly*. Additional followup studies of college students and graduates are available from surveys conducted by college placement offices, professional societies, and other organizations. Most of these data are limited to graduates from a single institution or field.

[6] Projections, along with a discussion of the projection methodology, have been published by NCES in *Projections of Education Statistics to 1992-93* (July 1985).

Table E-1. Enrollments and completions in occupationally specific public vocational education programs,[1] 1982-83

CIP code[2]	Title	Enrollments	Completions
	Total	5,853,769	1,790,698
01.00	Agribusiness and agricultural production	317,333	123,121
01.01	Agricultural business and management	13,214	6,792
01.02	Agricultural mechanics	60,057	23,413
01.03	Agricultural production	143,247	58,402
01.04	Agricultural products and processing	4,115	1,545
01.05	Agricultural services and supplies	15,746	7,042
01.06	Horticulture	64,570	20,256
01.99	Agribusiness and agricultural production, other	16,384	5,671
02.00	Agricultural sciences	5,259	1,852
02.02	Animal sciences	907	391
02.03	Food sciences	3	1
02.04	Plant sciences	665	216
02.05	Soil sciences	20	7
02.99	Agricultural sciences, other	3,664	1,237
03.00	Renewable natural resources	19,997	5,991
03.01	Renewable natural resources, general	6,592	1,740
03.02	Conservation and regulation	2,042	775
03.03	Fishing and fisheries	230	76
03.04	Forestry production and processing	10,130	3,085
03.06	Wildlife management	559	121
03.99	Renewable natural resources, other	444	194
06.00	Business and management	135,218	24,783
06.04	Business administration and management	58,528	5,836
06.07	Institutional management	8,988	2,290
06.14	Marketing management and research	23,426	4,190
06.1401	Marketing management	23,413	4,187
06.17	Real estate	29,707	10,010
06.18	Small business management and ownership	6,432	1,166
06.20	Trade and industrial supervision and management	8,137	1,291
07.00	Business and office	2,094,595	568,915
07.01	Accounting, bookkeeping, and related programs	423,342	105,047
07.02	Banking and related financial programs	22,272	5,460
07.03	Business data processing and related programs	448,452	79,739
07.0302	Business computer and console operation	82,506	10,872
07.0303	Business data entry equipment operation	13,496	5,066
07.0304	Business data peripheral equipment operation	1,719	1,101
07.04	Office supervision and management	100,196	12,703
07.05	Personnel and training programs	10,356	925
07.06	Secretarial and related programs	423,528	139,013
07.07	Typing, general office, and related programs	572,080	203,170
07.0701	Typing, general office, and related programs, general	367,648	140,667
07.0702	Clerk-typist	12,984	5,754
07.0707	Receptionist and communication systems operation	3,173	1,576
07.99	Business and office, other	94,369	22,858
08.00	Marketing and distribution	416,413	161,088
08.01	Apparel and accessories marketing	32,632	14,480
08.02	Business and personal services marketing	8,993	5,017
08.03	Entrepreneurship	2,670	1,248
08.04	Financial services marketing	21,750	3,346
08.05	Floristry, farm and garden supplies marketing	5,985	2,342
08.06	Food marketing	28,634	15,306
08.07	General marketing	129,044	46,548
08.0704	Purchasing	354	153
08.08	Home and office products marketing	4,913	2,256
08.09	Hospitality and recreation marketing	39,248	16,815
08.10	Insurance marketing	3,985	1,611
08.11	Transportation and travel marketing	19,938	7,305
08.1101	Transportation and travel marketing, general	9,585	4,429
08.1104	Tourism	5,550	961
08.1105	Travel services marketing	3,647	1,412
08.12	Vehicles and petroleum marketing	6,341	3,051
08.99	Marketing and distribution, other	112,280	41,763

See footnotes at end of table.

Table E-1. Continued—Enrollments and completions in occupationally specific public vocational education programs,[1] 1982-83

CIP code[2]	Title	Enrollments	Completions
09.00	Communications	10,605	2,475
09.02	Advertising	10,605	2,475
10.00	Communication technologies	16,091	3,099
10.0104	Radio and television production and broadcasting technology	7,938	1,678
11.00	Computer and information sciences	45,641	7,202
11.02	Computer programming	41,185	5,274
11.04	Information sciences and systems	165	38
11.99	Computer and information sciences, other	4,291	1,890
12.00	Consumer, personal, and miscellaneous services	110,693	44,860
12.01	Drycleaning and laundering services	1,176	514
12.03	Funeral services	1,588	464
12.04	Personal services	94,925	37,384
12.0402	Barbering	2,279	751
12.0403	Cosmetology	91,134	35,662
12.99	Consumer, personal, and miscellaneous services, other	13,004	6,498
15.00	Engineering and engineering-related technologies	309,292	55,866
15.01	Architectural technologies	15,210	2,621
15.02	Civil technologies	24,422	4,526
15.0203	Surveying and mapping technology	901	179
15.03	Electrical and electronic technologies	135,327	24,671
15.0302	Electrical technology	13,456	3,695
15.0303	Electronic technology	112,907	18,540
15.04	Electromechanical instrumentation and maintenance technologies	13,446	2,131
15.05	Environmental control technologies	11,006	2,725
15.0506	Water and wastewater technology	2,806	842
15.06	Industrial production technologies	26,411	5,345
15.07	Quality control and safety technologies	1,919	340
15.08	Mechanical and related technologies	36,564	5,850
15.0803	Automotive technology	13,061	1,400
15.09	Mining and petroleum technologies	6,134	932
15.99	Engineering and engineering-related technologies, other	38,853	6,725
17.00	Allied health	358,957	139,775
17.01	Dental services	28,728	11,800
17.0101	Dental assisting	17,899	8,073
17.0102	Dental hygiene	7,245	2,545
17.0103	Dental laboratory technology	3,584	1,182
17.02	Diagnostic and treatment services	50,088	15,770
17.0203	Electrocardiograph technology	950	654
17.0204	Electroencephalograph technology	135	71
17.0209	Radiograph medical technology	10,788	2,671
17.0210	Respiratory therapy technology	10,209	2,985
17.0211	Surgical technology	4,057	1,532
17.03	Medical laboratory technologies	20,648	6,360
17.04	Mental health/human services	15,473	4,300
17.05	Miscellaneous allied health services	33,689	11,648
17.0503	Medical assisting	18,907	6,099
17.0506	Medical records technology	3,280	834
17.0508	Physician assisting-primary care	5,361	1,544
17.0509	Physician assisting-specialty	45	40
17.06	Nursing-related services	149,803	69,373
17.07	Ophthalmic services	1,610	532
17.0701	Ophthalmic dispensing	942	247
17.08	Rehabilitation services	7,062	2,194
17.0818	Respiratory therapy	51	32
17.99	Allied health, other	51,856	17,798
18.00	Health sciences	115,629	29,031
18.11	Nursing	115,629	29,031
20.00	Vocational home economics	307,460	103,662
20.02	Child care and guidance management and services	97,469	28,515
20.03	Clothing, apparel, and textiles management, production, and services	37,773	11,795

See footnotes at end of table.

Table E-1. Continued—Enrollments and completions in occupationally specific public vocational education programs,[1] 1982-83

CIP code[2]	Title	Enrollments	Completions
20.04	Food production, management, and services	126,691	47,098
20.0403	Chef/cook	9,148	2,656
20.05	Home furnishings and equipment management, production, and services	10,728	2,346
20.06	Institutional, home management, and supporting services	15,996	5,843
20.0601	Institutional, home management, and supporting services, general	9,343	2,669
20.99	Vocational home economics, other	18,803	8,065
22.00	Law	7,117	886
22.0103	Legal assisting	7,117	886
25.00	Library and archival sciences	449	105
25.03	Library assisting	449	105
31.00	Parks and recreation	1,193	290
31.02	Outdoor recreation	1,193	290
41.00	Science technologies	5,688	1,432
41.01	Biological technologies	185	32
41.02	Nuclear technologies	666	208
41.03	Physical science technologies	3,876	992
41.99	Science technologies, other	961	200
43.00	Protective services	143,877	39,548
43.01	Criminal justice	92,219	19,832
43.02	Fire protection	37,066	16,637
43.99	Protective services, other	14,592	3,079
46.00	Construction trades	245,637	97,221
46.01	Brickmasonry, stonemasonry, and tile setting	21,706	8,201
46.0101	Brickmasonry, stonemasonry, and title setting, general	3,854	1,399
46.0102	Brick, block, and stonemasonry	17,809	6,784
46.0103	Title setting	43	18
46.02	Carpentry	69,196	27,377
46.03	Electrical and power transmission installation	57,366	20,097
46.0302	Electrician	33,841	12,616
46.04	Miscellaneous construction trades	13,882	6,070
46.0403	Construction inspection	46	9
46.0405	Floor covering installation	125	76
45.0406	Glazing	249	153
46.0408	Painting and decorating	1,834	767
46.05	Plumbing, pipefitting, and steamfitting	15,646	6,236
46.99	Construction trades, other	67,841	29,240
47.00	Mechanics and repairers	561,038	185,709
47.01	Electrical and electronics equipment repair	101,899	30,935
47.0101	Electrical and electronics equipment repair, general	56,539	16,710
47.0102	Business machine repair	1,612	477
47.0103	Communications electronics	15,522	4,755
47.0104	Computer electronics	1,340	254
47.0105	Industrial electronics	15,636	5,203
47.0106	Major appliance repair	7,880	2,640
47.0108	Small appliance repair	689	288
47.0109	Vending and recreational machine repair	2,364	499
47.02	Heating, air conditioning, and refrigeration mechanics	52,935	15,235
47.03	Industrial equipment maintenance and repair	16,450	4,636
47.0302	Heavy equipment maintenance and repair	3,722	1,081
47.04	Miscellaneous mechanics and repairers	4,250	1,632
47.0404	Muscial instrument repair	251	89
47.0406	Shoe and boot repair	522	196
47.05	Stationary energy sources	1,694	799
47.06	Vehicle and mobile equipment mechanics and repairers	362,707	123,067
47.0602	Aircraft mechanics	12,557	3,607
47.0603	Automotive body repair	67,920	22,324
47.0604	Automotive mechanics	219,362	74,538
47.0605	Diesel engine mechanics	24,185	7,556
47.0606	Small engine repair	22,543	8,175
47.99	Mechanics and repairers, other	21,103	9,405
48.00	Precision production	496,560	157,502

See footnotes at end of table.

Table E-1. Continued—Enrollments and completions in occupationally specific public vocational education programs,[1] 1982-83

CIP code[2]	Title	Enrollments	Completions
48.01	Drafting	99,325	28,500
48.02	Graphic and printing communications	117,368	35,508
48.0205	Composition, make-up, and typesetting	636	182
48.0206	Lithography, photography, and platemaking	744	180
48.03	Leatherworking and upholstering	7,222	2,213
48.0301	Leatherworking and upholstering, general	446	337
48.0303	Upholstering	6,704	1,855
48.04	Precision food production	2,492	952
48.05	Precision metal work	213,482	72,062
48.0503	Machine tool operation/machine shop	77,799	27,303
48.0506	Sheet metal	7,303	2,443
48.0507	Tool and die making	3,221	1,044
48.0508	Welding, brazing, and soldering	109,684	35,249
48.06	Precision work, assorted materials	3,531	1,409
48.0602	Jewelry design, fabrication, and repair	1,201	589
48.07	Woodworking	27,902	7,970
48.99	Precision production, other	25,238	8,888
49.00	Transportation and material moving	48,806	17,909
49.01	Air transportation	11,702	2,311
49.0101	Air transportation, general	4,281	1,323
49.0102	Airplane piloting and navigation	6,614	823
49.02	Vehicle and equipment operation	8,912	5,011
49.0205	Truck and bus driving	4,254	3,144
49.03	Water transportation	5,558	2,229
49.99	Transportation and material moving, other	22,634	8,358
50.00	Visual and performing arts	4,332	1,256
50.08	Graphic arts technology	4,332	1,256
99.00	Other, not elsewhere classified	75,889	17,120

[1]Occupationally specific enrollments include students above grade 10 enrolled in programs which are designed to train individuals for specific occupations. Excluded are all programs in industrial arts and consumer and homemaking training as well as prevocational, counseling and guidance, and cluster programs (those programs that include 4 or more subjects that cannot be separated and identified as a complete program).

[2] CIP codes are the taxonomy used by the National Center for Education Statistics to classify instructional programs. See *A Classification of Instructional Programs* (U.S. Department of Education, 1981).

SOURCE: U.S. Department of Education, National Center for Education Statistics.

Table E-2. Total enrollments, total completions, total who left with or without a marketable skill, and total still enrolled, by program, for noncollegiate postsecondary schools with occupational programs, 1980-81[1]

DOE instructional code and title[2]	Total enrollments	Completions	Left with marketable skill	Left without marketable skill	Still enrolled
Total, all programs	1,555,526	889,969	92,188	246,614	323,755
01. Agriculture, total	8,426	3,516	643	1,706	2,563
01.0100 Agricultural production	1,546	510	171	192	674
01.0200 Agricultural supplies/services	1,679	1,034	102	265	278
01.0300 Agricultural mechanics	725	275	38	149	263
01.0400 Agricultural products	1,285	504	116	247	419
01.0500 Ornamental horticulture	2,773	977	186	783	827
01.0600 Agricultural resources	171	121	8	5	37
01.0700 Forestry	247	95	22	65	65
04. Marketing and distribution, total	246,967	191,778	8,462	28,383	18,348
04.0100 Advertising services	145	59	4	28	55
04.0200 Apparel and accessories	12,369	6,388	2,030	1,485	2,466
04.0400 Finance and credit	19,053	17,111	182	1,379	381
04.0500 Floristry	4,264	3,453	231	310	270
04.0600 Food distribution	99	73	9	18	0
04.0700 Food service technology	782	291	88	162	240
04.0800 General merchandise	6,011	3,635	243	998	1,135
04.0900 Hardware, building materials	27	19	5	3	0
04.1000 Home furnishings	69	16	10	43	0
04.1100 Hotel and lodging	1,108	261	153	218	476
04.1300 Insurance	7,517	6,048	373	819	276
04.1600 Petroleum sales	52	14	4	15	19
04.1700 Real estate	97,399	78,681	2,484	11,637	4,597
04.1800 Recreation and tourism	44,717	34,012	840	5,146	4,720
04.1900 Transportation services	2,385	1,069	427	128	762
04.2000 Retail trade, other	1,479	842	86	362	190
04.3100 Wholesale trade, other	723	708	0	16	0
04.9900 Other	48,768	39,098	1,293	5,616	2,761
07. Health occupations, total	164,057	91,603	7,667	21,589	43,209
07.0101 Dental assistant	11,140	7,354	432	1,518	1,836
07.0102 Dental hygiene (associate)	97	46	10	18	23
07.0103 Dental laboratory technology	1,897	740	77	305	775
07.0199 Dental, other	3,708	2,448	341	490	429
07.0201 Cytology	131	92	0	39	0
07.0202 Histology	54	53	0	0	1
07.0203 Medical laboratory assisting	3,356	2,069	124	422	742
07.0204 Hematology	253	129	16	33	75
07.0299 Medical laboratory technology, other	3,608	2,277	83	608	640
07.0301 Nursing (associate degree)	12,738	5,061	247	1,242	6,188
07.0302 Practical (vocational) nursing	30,921	16,973	2,127	4,808	7,013
07.0303 Nursing assistant (aide)	24,792	18,532	1,203	3,169	1,888
07.0304 Psychiatric aide	370	62	64	33	212
07.0305 Surgical technician	1,401	901	44	203	254
07.0399 Nursing, other	19,604	6,367	538	1,956	10,743
07.0401 Occupational therapy	155	55	8	36	57
07.0499 Rehabilitation services, other	28	10	4	6	8
07.0501 X-ray technician	7,353	3,383	94	817	3,060
07.0502 Radiation therapy	21	21	0	0	0
07.0503 Nuclear medical technology	331	214	0	48	69
07.0599 Radiologic, other	222	114	0	0	108
07.0600 Optical technology	675	383	50	114	128
07.0800 Mental health technology	111	55	0	35	22
07.0901 Electroencephalograph technology	70	0	0	0	70
07.0902 Electrocardiograph technology	791	508	53	124	106
07.0903 Inhalation therapy technology	6,163	3,219	297	973	1,675
07.0904 Medical assisting (office)	24,160	15,035	1,544	3,196	4,385
07.0906 Community health aide	75	69	1	3	3

See footnotes at end of table.

Table E-2. Continued—Total enrollments, total completions, total who left with or without a marketable skill, and total still enrolled, by program, for noncollegiate postsecondary schools with occupational programs, 1980-81[1]

DOE instructional code and title[2]		Total enrollments	Completions	Left with marketable skill	Left without marketable skill	Still enrolled
07.0907	Medical emergency technician	1,885	1,260	36	230	360
07.0909	Mortuary science	560	296	0	165	100
07.0915	Medical records technicians	958	495	82	163	218
07.9900	Health occupations, other	5,283	2,533	161	610	1,980
09. Home economics, total		9,005	4,702	753	1,539	2,011
09.0201	Child care	3,136	1,202	235	574	1,125
09.0202	Clothing management, production, and services	2,337	1,379	251	403	303
09.0203	Food management, production, and services	1,305	582	97	265	361
09.0204	Home furnishings	593	300	40	148	105
09.0205	Institutional/home management	783	522	109	102	50
09.0299	Home economics, other	851	717	21	47	67
14. Business and office, total		366,759	180,455	35,166	73,046	78,096
14.0100	Accounting	45,630	19,880	4,130	9,888	11,732
14.0201	Computer operator	8,949	3,276	2,867	2,340	466
14.0202	Peripheral equipment operator	13,670	7,899	882	2,851	2,039
14.0203	Computer programmer	40,246	22,329	2,539	7,370	8,009
14.0204	System analyst	206	99	10	36	61
14.0299	Business data processing, other	45,880	21,580	3,147	8,658	12,496
14.0300	General office	26,469	11,497	2,533	7,172	5,268
14.0400	Information communication occupations	3,843	1,559	345	1,063	876
14.0500	Materials support occupations	136	100	0	36	0
14.0600	Personnel occupations	59	23	0	12	23
14.0700	Stenographic, secretarial, and related occupations	117,507	62,486	11,879	20,535	22,608
14.0800	Supervisory and administrative management occupations	21,850	10,134	1,751	4,988	4,977
14.0900	Typing and related occupations	11,247	7,278	669	1,644	1,659
14.9900	Office occupations, other	31,067	12,315	4,416	6,453	7,882
16. Technical occupations, total		132,997	65,534	8,597	21,650	37,218
16.0101	Aeronautical technology	1,036	510	8	180	338
16.0102	Agriculture technology	1,510	53	42	99	1,316
16.0103	Architectural technology	2,236	748	135	558	797
16.0104	Automotive technology	10,384	5,085	391	2,107	2,800
16.0105	Chemical technology	386	213	27	72	75
16.0106	Civil technology	9,502	3,478	695	2,067	3,261
16.0107	Electrical technology	3,328	1,316	395	753	863
16.0108	Electronic technology	45,919	18,189	2,687	7,263	17,421
16.0109	Electromechanical technology	2,997	1,090	166	812	929
16.0110	Environmental-control technology	2,524	1,525	39	465	495
16.0111	Industrial technology	1,298	447	160	321	370
16.0112	Instrumentation technology	727	231	99	120	278
16.0113	Mechanical technology	1,408	473	136	268	531
16.0114	Metallurgical technology	435	135	25	84	191
16.0115	Nuclear technology	79	28	0	13	38
16.0116	Petroleum technology	241	173	5	31	33
16.0117	Scientific data processing	64	64	0	0	0
16.0203	Food processing technology	87	87	0	0	0
16.0601	Commercial pilot training	1291	184	4	8	95
16.0602	Fire and fire safety technology	1,265	1,225	6	0	34
16.0603	Forestry technology	147	35	8	80	24
16.0605	Police science technology	889	763	0	6	120
16.0606	Teacher's assistant	700	238	50	195	217
16.0607	Library assistant	4,235	2,886	388	439	522
16.0608	Broadcast technician	17,632	10,057	1,253	2,780	3,543
16.0695	Performing artists	18,655	13,960	1,310	1,646	1,739
16.0699	Technology, other	5,020	2,341	568	923	1,188
17. Trade and industrial, total		627,318	352,389	30,951	101,711	142,497
17.0100	Air conditioning installation and repair	22,240	8,999	1,685	4,546	7,009

See footnotes at end of table.

Table E-2. Continued—Total enrollments, total completions, total who left with or without a marketable skill, and total still enrolled, by program, for noncollegiate postsecondary schools with occupational programs, 1980-81[1]

DOE instructional code and title[2]		Total enrollments	Completions	Left with marketable skill	Left without marketable skill	Still enrolled
17.0200	Appliance repair	2,309	905	264	482	658
17.0301	Body and fender repair	13,535	5,330	1,218	2,930	4,058
17.0302	Auto mechanic	40,457	13,862	4,140	8,238	14,217
17.0303	Auto specialization repair	8,770	5,824	335	1,335	1,276
17.0399	Automotive services, other	871	303	57	327	183
17.0401	Aircraft maintenance	7,667	1,992	373	1,966	3,335
17.0500	Blueprint reading	1,043	613	14	322	94
17.0600	Business machine maintenance	976	335	52	272	317
17.0700	Commercial art occupations	25,650	12,910	799	3,502	8,439
17.0800	Commercial fishing occupations	136	37	0	5	94
17.0900	Commercial photography occupations	7,109	3,999	191	790	2,130
17.1001	Carpentry	9,619	4,542	830	2,002	2,246
17.1002	Electricity	5,449	2,229	562	1,050	1,607
17.1003	Heavy equipment maintenance operations	5,297	2,845	327	898	1,226
17.1004	Masonry	3,522	1,248	363	937	975
17.1005	Painting and decorating	970	476	43	236	216
17.1007	Plumbing and pipefitting	4,261	2,213	363	767	918
17.1010	Roofing	111	67	22	18	5
17.1099	Construction and maintenance trades, other	5,983	3,027	326	1,035	1,595
17.1100	Custodial services	3,180	1,234	153	555	1,237
17.1200	Diesel mechanic	19,975	9,700	1,348	2,957	5,971
17.1300	Drafting occupations	21,363	7,962	1,647	4,696	7,058
17.1400	Electrical occupations, other	6,340	2,641	481	1,401	1,817
17.1503	Radio and TV repair	4,388	1,707	406	1,074	1,201
17.1599	Electronics occupations, other	12,155	5,503	657	2,624	3,372
17.1600	Fabric maintenance services	380	250	58	64	8
17.1900	Graphic arts occupations	7,876	3,444	564	1,794	2,073
17.2000	Industrial atomic energy occupations	506	159	29	153	165
17.2100	Instrument maintenance and repair occupations	2,256	1,419	120	324	392
17.2200	Maritime occupations	11,293	8,453	288	1,513	1,038
17.2302	Machine shop occupations	2,565	1,337	115	393	721
17.2302	Machine tool operations	14,208	4,878	1,252	3,369	4,710
17.2306	Welding and cutting	64,525	35,030	4,563	12,288	12,645
17.2307	Tool and die making	920	443	62	84	331
17.2399	Metalworking, other	3,274	1,566	332	506	869
17.2400	Metallurgy occupations	744	369	39	145	192
17.2601	Barbering	13,400	9,927	477	1,352	1,645
17.2602	Cosmetology	167,388	113,179	2,743	21,894	29,572
17.2699	Personal services, other	8,930	6,336	137	916	1,542
17.2700	Plastics occupations	622	273	33	138	178
17.2801	Firefighter training	1,046	645	31	83	288
17.2802	Law enforcement training	762	279	145	154	184
17.2899	Public service occupations, other	160	86	5	38	31
17.2900	Quantity food occupations	8,283	3,401	749	1,666	2,466
17.3000	Refrigeration engineering	7,363	2,681	285	1,487	2,909
17.3100	Small engine repair, internal combustion	2,285	896	230	594	565
17.3200	Stationary energy sources	6,021	4,968	206	484	363
17.3300	Textile production and fabrication	613	512	2	51	49
17.3400	Leatherworking	74	20	6	19	28
17.3500	Upholstering	2,088	1,104	120	338	527
17.3600	Woodworking occupations	3,513	1,321	240	963	989
17.4000	Truckdriving	43,393	34,995	834	3,418	4,256
17.5000	Dog grooming	2,420	1,768	107	530	16
17.9900	Trade and industrial occupations, other	17,034	12,257	478	1,988	2,310

[1]Does not include collegiate, flight, and other schools.

[2]DOE instructional codes and titles refer to the Handbook VI Vocational Programs code and titles. Data collected after 1980-81 are classified under the CIPS taxonomy. For coding information, see Handbook VI (U.S. Department of Education, National Center for Education Statistics).

SOURCE: U.S. Department of Education, National Center for Education Statistics.

Table E-3. Enlisted strength in Department of Defense occupational groups, June 30, 1985

DOD code	Group title and description of coverage	Enlisted strength
0	INFANTRY, GUN CREWS, AND SEAMANSHIP SPECIALISTS	266,283
01	*Infantry* – includes weapon specialists, ground reconnaissance and crew-served artillery specialists, armor and amphibious crews, and specialists in combat engineering and seamanship	109,908
02	*Armor and Amphibious*	24,095
03	*Combat Engineering* – includes specialists in hasty and temporary construction of airfields, roads, and bridges and in demolition, field illumination, and chemical warfare	23,191
04	*Artillery/Gunnery, Rockets, and Missiles* – includes conventional field, anti-air and shipboard guns and artillery, and rocket and missile specialists	56,061
05	*Air Crew* – includes pilots and navigators, flight engineers, and other air crew	10,841
06	*Seamanship* – includes boatswains, navigators, and other seamanship specialists	15,852
07	*Installation Security* – includes specialists who guard weapon systems, defend installations, and protect personnel, equipment, and facilities	26,335
1	ELECTRONIC EQUIPMENT REPAIRERS	174,020
10	*Radio/Radar* – includes fixed and mobile radio, air traffic and tracking radar, communication, navigation, and electronic countermeasure gear	81,806
11	*Fire Control Electronic System (Non-Missile)*	8,692
12	*Missile Guidance, Control and Checkout* – includes specialists in guidance, control, and checkout equipment for guided and ballistic missiles	23,750
13	*Sonar Equipment* – includes specialists in underwater detection and fire control systems, oceanographic equipment, and related antisubmarine gear	8,590
14	*Nuclear Weapons Equipment*	1,365
15	*ADP Computers*	9,888
16	*Teletype and Cryptographic Equipment*	14,985
19	*Other Electronic Equipment* – includes training devices, inertial navigation systems, and electronics instruments specialists	24,944
2	COMMUNICATIONS AND INTELLIGENCE SPECIALISTS	176,703
20	*Radio and Radio Code* – includes operators of radio, radio teletype, and visual communications equipment	60,112
21	*Sonar*	3,829
22	*Radar and Air Traffic Control*	29,859
23	*Signal Intelligence/Electronic Warfare* – includes the intercept, translation, and analysis of foreign communications, and the operation of electronic countermeasures equipment	30,189
24	*Intelligence* – includes the gathering, receipt, and analysis of nonsignal intelligence data, the interrogation of prisoners, other language translators and interpreters, image interpretation, and specialists in counterintelligence and investigational activities	10,422
25	*Combat Operations Control* – includes specialists in forward area tactical operations and intelligence and in command post control activities	24,884
26	*Communications Center Operations* – includes the receipt and distribution of messages, the operation of communications center equipment, and the operation of major field communications systems	17,408
3	MEDICAL AND DENTAL SPECIALISTS	88,725
30	*Medical Care*	61,587
31	*Technical Medical Services* – includes laboratory, pharmaceutical, and X-ray services	12,014
32	*Related Medical Services* – includes specialists in sanitation, health preservation, and veterinary services and preventive medical services	5,924
33	*Dental Care* – includes specialists in dental care and treatment and in related technical and laboratory services	9,200
4	OTHER TECHNICAL AND ALLIED SPECIALISTS	43,690
40	*Photography* – includes still, motion, and television camera operators, precision photographic processing, editing, and broadcasting	5,429
41	*Mapping, Surveying, Drafting, and Illustrating*	7,974
42	*Weather* – includes specialists in the collection of weather and sea condition data and weather forecasting	5,174
43	*Ordnance Disposal and Diving* – includes the excavation and rendering safe of explosive ordnance and of chemical and nuclear agents, and underwater demolition and other types of diving	1,969
45	*Musicians*	5,128
49	*Technical Specialists, N.E.C.* – includes physical science laboratory analysts, specialists in memorial activities, safety, NBC warfare, and firefighting and damage control, and other technical specialists and aides such as scientific engineering assistants	18,016

See note at end of table.

Table E-3. Continued—Enlisted strength in Department of Defense occupational groups, June 30, 1985

DOD code	Group title and description of coverage	Enlisted strength
5	FUNCTIONAL SUPPORT AND ADMINISTRATION	292,488
50	*Personnel* – includes specialists in personnel administration, personnel and manpower management, and recruiting and counseling	41,319
51	*Administration* – includes clerks, typists, and stenographers and legal and medical administrative specialists	76,470
52	*Clerical/Personnel* – includes combined personnel and administrative specialists and senior enlisted personnel whose primary responsibilities are non-technical	7,056
53	*Data Processing* – includes computer operators, analysts, and programmers and electric accounting machine operators	24,329
54	*Accounting, Finance, Disbursing*	15,019
55	*Other Functional Support* – includes specialists who provide support in the functional areas of supply accounting and procurement, transportation, flight operations, and related areas	116,402
56	*Religious, Morale, and Welfare* – includes chaplains' assistants and specialists in theater, arts, sports, and related activities	5,940
57	*Information and Education* – includes specialists in public affairs, radio/TV, and other types of information and education	5,953
6	ELECTRICAL/MECHANICAL EQUIPMENT REPAIRERS	369,713
60	*Aircraft and Related* – includes aircraft engines, electrical systems, structural components and surfaces, and launch equipment	158,899
61	*Automotive* – includes construction equipment and other wheel and track vehicles	68,874
62	*Wire communications* – includes specialists in the installation and maintenance of telephones, switchboards, and central office and related interior communications equipment	20,536
63	*Missile, Mechanical and Electrical* – includes missiles and missile systems and related components	4,620
64	*Armament and Munitions* – includes small arms, artillery, mines, bombs and associated mountings, nuclear weapons, and ammunition renovation	41,559
65	*Shipboard Propulsion* – includes marine main engines, boilers, and auxiliary equipment	39,601
66	*Power Generating Equipment* – includes nuclear power reactors and primary electric generating plants	35,776
67	*Precision Equipment* – includes optical and other precision instruments and office machines	3,133
69	*Other Mechanical and Electrical Equipment* – includes specialists in the maintenance and repair of mechanical and electrical equipment which is not readily classifiable in another group	1,715
7	CRAFT WORKERS	76,888
70	*Metalworking* – includes specialists in the machining, shaping, and forming of metal and in the fabrication of metal parts	15,029
71	*Construction* – includes specialists in construction trades and construction equipment operation	25,922
72	*Utilities* – includes plumbers, heating and cooling specialists, and electricians	20,401
74	*Lithography*	1,933
75	*Industrial Gas and Fuel Production* – includes specialists in the production of liquid oxygen, hydrogen, nitrogen, and carbon dioxide	626
76	*Fabric, Leather, and Rubber*	2,661
79	*Other Craft Workers, N.E.C.* – includes specialists in trades such as molding, camouflage, and plastic work, which are not readily classifiable elsewhere in this section	10,316
8	SERVICE AND SUPPLY HANDLERS	175,336
80	*Food Service*	49,360
81	*Motor Transport* – includes the operation of wheel and track vehicles (except construction equipment) and railway equipment	34,334
82	*Material Receipt, Storage, and Issue* – includes specialists in the receipt, storage, issue, and shipment of general and specialized classes of supplies, excluding ammunition	36,844
83	*Law Enforcement* – includes military police, protective and corrections specialists, and criminal and noncriminal inspectors and investigators	45,145
84	*Personal Service* – includes laundry, dry cleaning, and related services	2,769
86	*Forward Area Equipment* – includes specialists in parachute packing and repair, in aerial delivery operations, and in flight equipment fitting and maintenance	6,884

NOTE: Definitions are provided for most occupational groups. The lack of explanatory material for a few groups indicates that the title of the grouping is considered a sufficient definition.

SOURCE: U.S. Department of Defense, Defense Manpower Data Center—Enlisted Master File.

Table E-4. Associate degrees and other formal awards below the baccalaureate level granted in 1982-83

CIP code[1]	Curriculum	Associate degrees	Curriculums of at least 1 but less than 4 years	Curriculums of under 1 year
	Total	453,960	114,989	28,044
01.00	Agribusiness and agricultural production	4,732	2,366	437
01.01	Agricultural business and management	1,092	257	106
01.02	Agricultural mechanics	316	362	40
01.03	Agricultural production	695	369	82
01.04	Agricultural products and processing	20	1	0
01.05	Agricultural services and supplies	424	134	103
01.06	Horticulture	1,177	1,177	101
01.99	Agribusiness and agricultural production, other	1,008	66	5
02.00	Agricultural sciences	1,459	812	16
02.01	Agricultural sciences, general	388	39	1
02.02	Animal sciences	785	621	2
02.03	Food sciences	25	29	13
02.04	Plant sciences	196	110	0
02.0402	Agronomy	17	52	0
02.0409	Range management	4	0	0
02.05	Soil sciences	8	0	0
02.99	Agricultural sciences, other	57	13	0
03.00	Renewable natural resources	1,454	189	51
03.01	Renewable natural resources, general	123	57	0
03.02	Conservation and regulation	102	3	1
03.03	Fishing and fisheries	48	19	6
03.04	Forestry production and processing	458	51	21
03.05	Forestry and related sciences	296	24	23
03.06	Wildlife management	364	32	0
03.99	Renewable natural resources, other	63	3	0
04.00	Architecture and environmental design	1,454	210	22
04.01	Architecture and environmental design, general	107	7	0
04.02	Architecture	111	0	0
04.03	City, community, and regional planning	1	0	0
04.04	Environmental design	32	0	0
04.05	Interior design	1,183	203	22
04.06	Landscape architecture	20	0	0
05.00	Area and ethnic studies	21	3	34
05.01	Area studies	3	2	30
05.02	Ethnic studies	16	1	4
05.99	Area and ethnic studies, other	2	0	0
06.00	Business and management	49,619	8,257	1,323
06.01	Business and management, general	13,152	716	237
06.02	Accounting	6,028	731	103
06.03	Banking and finance	500	51	6
06.04	Business administration and management	21,272	4,965	141
06.0402	Contract management and procurement/purchasing	74	4	3
06.05	Business economics	9	0	0
06.06	Human resources development	21	3	1
06.07	Institutional management	2,692	331	280
06.08	Insurance and risk management	50	4	0
06.09	International business management	2	0	4
06.10	Investments and securities	6	0	0
06.11	Labor/industrial relations	251	372	50
06.12	Management information systems	79	28	0
06.13	Management science	314	48	2
06.14	Marketing management and research	2,006	133	30
06.1401	Marketing management	1,869	125	30
06.15	Organizational behavior	25	19	0
06.16	Personnel management	75	22	19
06.17	Real estate	1,081	252	253
06.18	Small business management and ownership	347	63	7
06.19	Taxation	6	158	16
06.20	Trade and industrial supervision and management	1,040	289	41
06.99	Business and management, other	663	72	133

See footnote at end of table.

Table E-4. Continued—Associate degrees and other formal awards below the baccalaureate level granted in 1982-83

CIP code[1]	Curriculum	Associate degrees	Curriculums of at least 1 but less than 4 years	Curriculums of under 1 year
07.00	Business and office	51,353	18,227	4,691
07.01	Accounting, bookkeeping, and related programs	8,347	1,598	342
07.02	Banking and related financial programs	573	104	195
07.03	Business data processing and related programs	16,201	3,930	1,016
07.0302	Business computer and console operation	229	871	199
07.0303	Business data entry equipment operation	129	661	335
07.0304	Business data peripheral equipment operation	79	91	22
07.04	Office supervision and management	2,755	186	164
07.05	Personnel and training programs	82	45	0
07.06	Secretarial and related programs	19,066	8,719	1,955
07.07	Typing, general office, and related programs	1,285	3,055	937
07.0701	Typing, general office, and related programs, general	770	540	238
07.0702	Clerk-typist	120	1,445	236
07.0707	Receptionist and communication systems operation	51	65	112
07.99	Business and office, other	3,044	590	82
08.00	Marketing and distribution	14,449	2,326	969
08.01	Apparel and accessories marketing	2,213	415	31
08.02	Business and personal services marketing	395	28	0
08.03	Entrepreneurship	130	0	0
08.04	Financial services marketing	81	27	0
08.05	Floristry, farm and garden supplies marketing	16	43	23
08.06	Food marketing	111	32	68
08.07	General marketing	2,526	274	112
08.0704	Purchasing	34	42	0
08.08	Home and office products marketing	74	9	5
08.09	Hospitality and recreation marketing	309	113	157
08.10	Insurance marketing	32	44	22
08.11	Transportation and travel marketing	1,124	539	475
08.1101	Transportation and travel marketing, general	132	40	129
08.1104	Tourism	540	247	150
08.1105	Travel services marketing	336	156	200
08.12	Vehicles and petroleum marketing	44	90	7
08.99	Marketing and distribution, other	7,394	712	65
09.00	Communications	2,020	135	7
09.01	Communications, general	394	6	0
09.02	Advertising	138	44	0
09.04	Journalism	502	15	5
09.05	Public relations	60	0	0
09.06	Radio/television news broadcast	44	7	2
09.07	Radio/television, general	258	41	0
09.99	Communications, other	624	22	0
10.00	Communications technologies	1,814	289	8
10.0104	Radio and television production and broadcasting technology	589	80	0
11.00	Computer and information sciences	9,670	1,697	765
11.01	Computer and information sciences, general	2,201	264	87
11.02	Computer programming	3,545	756	565
11.03	Data processing	3,106	468	80
11.04	Information sciences and systems	593	206	33
11.05	Systems analysis	28	2	0
11.99	Computer and information sciences, other	197	1	0
12.00	Consumer, personal, and miscellaneous services	858	3,295	1,107
12.01	Drycleaning and laundering services	1	3	0
12.02	Entertainment services	16	22	0
12.03	Funeral services	391	270	32
12.04	Personal services	389	2,958	1,073
12.0402	Barbering	2	100	13
12.0403	Cosmetology	383	2,744	370
12.99	Consumer, personal, and miscellaneous services, other	61	42	2
13.00	Education	7,520	354	44
13.01	Education, general	4,852	5	6
13.02	Bilingual/bicultural education	75	15	0

See footnote at end of table.

Table E-4. Continued—Associate degrees and other formal awards below the baccalaureate level granted in 1982-83

CIP code[1]	Curriculum	Associate degrees	Curriculums of at least 1 but less than 4 years	Curriculums of under 1 year
13.04	Education administration	148	19	0
13.05	Educational media	35	17	0
13.08	School psychology	1	0	0
13.10	Special education	166	54	3
13.11	Student counseling and personnel services	0	3	0
13.12	Teacher education, general programs	1,134	118	29
13.1202	Elementary education	392	1	0
13.1203	Junior high education	1	0	0
13.1204	Pre-elementary education	605	117	29
13.1205	Secondary education	66	0	0
13.13	Teacher education, specific subject areas	896	68	1
13.14	Teaching English as a second language/foreign language	0	8	0
13.99	Education, other	213	47	5
14.00	Engineering	3,207	85	9
14.01	Engineering, general	2,433	48	7
14.02	Aerospace, aeronautical, and astronautical engineering	52	0	0
14.03	Agricultural engineering	0	22	0
14.04	Architectural engineering	5	4	0
14.06	Ceramic engineering	20	0	0
14.07	Chemical engineering	10	0	0
14.08	Civil engineering	40	3	0
14.09	Computer engineering	11	0	0
14.10	Electrical, electronics, and communications engineering	276	5	0
14.11	Engineering mechanics	1	0	0
14.12	Engineering physics	4	0	0
14.13	Engineering science	73	0	0
14.14	Environmental health engineering	10	0	0
14.17	Industrial engineering	15	0	0
14.19	Mechanical engineering	72	2	0
14.25	Petroleum engineering	2	0	0
14.26	Surveying and mapping sciences	2	0	0
14.99	Engineering, other	181	1	2
15.00	Engineering and engineering-related technologies	46,404	13,137	1,534
15.01	Architectural technologies	1,678	118	4
15.02	Civil technologies	4,167	644	64
15.0203	Surveying and mapping technology	259	51	11
15.03	Electrical and electronic technologies	23,173	6,779	482
15.0302	Electrical technology	2,354	344	18
15.0303	Electronic technology	13,619	5,936	284
15.04	Electromechanical instrumentation and maintenance technologies	2,177	578	42
15.05	Environmental control technologies	1,374	949	224
15.0506	Water and wastewater technology	170	131	113
15.06	Industrial production technologies	3,079	945	241
15.07	Quality control and safety technologies	353	230	43
15.08	Mechanical and related technologies	7,369	1,203	422
15.0803	Automotive technology	1,585	649	352
15.09	Mining and petroleum technologies	1,233	106	0
15.99	Engineering and engineering-related technologies, other	1,801	1,585	12
16.00	Foreign languages	342	39	0
16.01	Foreign languages, multiple emphasis	154	0	0
16.03	Asiatic languages	5	0	0
16.04	Balto-Slavic languages	2	0	0
16.05	Germanic languages	16	0	0
16.09	Italic languages	127	0	0
16.11	Semitic languages	0	1	0
16.99	Foreign languages, other	38	38	0
17.00	Allied health	25,866	24,515	8,817
17.01	Dental services	4,546	2,933	318
17.0101	Dental assisting	636	2,367	271
17.0102	Dental hygiene	3,244	380	22
17.0103	Dental laboratory technology	660	167	20
17.02	Diagnostic and treatment services	5,403	3,039	1,789
17.0203	Electrocardiograph technology	12	15	0

See footnote at end of table.

Table E-4. Continued—Associate degrees and other formal awards below the baccalaureate level granted in 1982-83

CIP code[1]	Curriculum	Associate degrees	Curriculums of at least 1 but less than 4 years	Curriculums of under 1 year
17.0204	Electroencephalograph technology	21	8	0
17.0205	Emergency medical technology-ambulance	485	500	1,441
17.0206	Emergency medical technology-paramedic	200	550	140
17.0209	Radiograph medical technology	2,856	167	7
17.0210	Respiratory therapy technology	1,196	803	78
17.0211	Surgical technology	209	834	109
17.03	Medical laboratory technologies	3,019	236	8
17.04	Mental health/human services	2,041	445	216
17.05	Miscellaneous allied health services	3,838	2,163	1,376
17.0503	Medical assisting	1,803	1,363	620
17.0506	Medical records technology	873	160	36
17.0508	Physician assisting-primary care	91	124	6
17.06	Nursing-related services	2,710	14,417	4,772
17.07	Ophthalmic services	562	115	14
17.0701	Ophthalmic dispensing	145	6	0
17.08	Rehabilitation services	2,934	621	36
17.99	Allied health, other	813	546	288
18.00	Health sciences	39,883	669	262
18.01	Audiology and speech pathology	9	8	0
18.03	Chiropractic	10	0	0
18.04	Dentistry	1	22	41
18.07	Health sciences administration	112	12	0
18.09	Medical laboratory	18	0	0
18.10	Medicine	340	25	104
18.11	Nursing	38,249	505	93
18.12	Optometry	7	0	0
18.14	Pharmacy	4	0	0
18.17	Pre-dentistry	20	0	0
18.18	Pre-medicine	105	0	0
18.19	Pre-pharmacy	46	0	0
18.20	Pre-veterinary	21	0	0
18.24	Veterinary medicine	0	1	0
18.99	Health sciences, other	941	96	24
19.00	Home economics	1,045	302	1
19.01	Home economics, general	179	8	0
19.02	Business home economics	2	0	0
19.03	Family and community services	168	0	0
19.04	Family/consumer resource management	23	1	0
19.05	Food sciences and human nutrition	223	73	1
19.07	Individual and family development	90	39	0
19.09	Textiles and clothing	320	159	0
19.99	Home economics, other	40	22	0
20.00	Vocational home economics	7,999	3,452	964
20.01	Consumer and homemaking home economics	1,114	704	126
20.02	Child care and guidance management and services	3,084	1,185	509
20.03	Clothing, apparel, and textiles management, production, and services	176	1,130	3
20.04	Food production, management, and services	3,484	1,250	509
20.0403	Chef/cook	892	221	109
20.05	Home furnishings and equipment management, production, and services	40	90	11
20.06	Institutional, home management, and supporting services	46	76	32
20.99	Vocational home economics, other	59	17	14
22.00	Law	1,742	452	93
22.0103	Legal assisting	1,550	442	23
23.00	Letters	618	15	77
23.01	English, general	404	0	73
23.04	Composition	3	0	0
23.05	Creative writing	2	0	0
23.06	Linguistics (includes phonetics, semantics, and philology)	0	13	2
23.08	Literature, English	2	0	0
23.09	Rhetoric	1	0	0

See footnote at end of table.

Table E-4. Continued—Associate degrees and other formal awards below the baccalaureate level granted in 1982-83

CIP code[1]	Curriculum	Associate degrees	Curriculums of at least 1 but less than 4 years	Curriculums of under 1 year
23.10	Speech, debate, and forensics	84	0	0
23.11	Technical and business writing	8	0	2
23.99	Letters, other	114	2	0
24.00	Liberal/general studies	107,625	675	81
25.00	Library and archival sciences	218	83	4
25.01	Library and archival sciences, general	45	11	0
25.03	Library assisting	130	62	4
25.04	Library science	36	7	0
25.05	Museology	2	0	0
25.99	Library and archival sciences, other	5	3	0
26.00	Life sciences	981	105	0
26.01	Biology, general	763	1	0
26.02	Biochemistry and biophysics	1	0	0
26.03	Botany	6	0	0
26.05	Microbiology	8	30	0
26.06	Miscellaneous specialized areas, life sciences	93	0	0
26.07	Zoology	15	74	0
26.99	Life sciences, other	95	0	0
27.00	Mathematics	777	2	2
27.01	Mathematics, general	723	2	2
27.03	Applied mathematics	21	0	0
27.99	Mathematics, other	33	0	0
28.00	Military sciences	1	0	0
28.03	Military science (Army)	1	0	0
29.00	Military technologies	87	0	0
30.00	Multi/interdisciplinary studies	10,247	117	62
30.01	Biological and physical sciences	2,398	1	1
30.03	Engineering and other disciplines	247	0	0
30.04	Humanities and social sciences	4,032	9	0
30.07	Women's studies	0	0	4
30.99	Multi/interdisciplinary studies, other	3,570	107	57
31.00	Parks and recreation	1,020	120	2
31.01	Parks and recreation, general	455	23	1
31.02	Outdoor recreation	204	55	1
31.03	Parks and recreation management	297	11	0
31.04	Water resources	0	1	0
31.99	Parks and recreation, other	64	30	0
38.00	Philosophy and religion	178	45	1
38.01	Philosophy	26	1	0
38.02	Religion	145	33	0
38.99	Philosophy and religion, other	7	11	1
39.00	Theology	671	639	51
39.02	Bible studies	302	226	27
39.03	Missionary studies	8	0	0
39.04	Religious education	114	66	0
39.05	Religious music	21	2	4
39.06	Theological studies	164	161	18
39.99	Theology, other	62	184	2
40.00	Physical sciences	1,665	2	23
40.01	Physical sciences, general	1,075	1	0
40.02	Astronomy	4	0	0
40.04	Atmospheric sciences and meteoroloy	126	0	0
40.05	Chemistry	188	1	0
40.06	Geological sciences	112	0	0
40.07	Miscellaneous physical sciences	34	0	23
40.08	Physics	91	0	0
40.99	Physical sciences, other	35	0	0

See footnote at end of table.

Table E-4. Continued—Associate degrees and other formal awards below the baccalaureate level granted in 1982-83

CIP code[1]	Curriculum	Associate degrees	Curriculums of at least 1 but less than 4 years	Curriculums of under 1 year
41.00	Science technologies	1,438	75	1
41.01	Biological technologies	140	4	1
41.02	Nuclear technologies	396	10	0
41.03	Physical science technologies	548	56	0
41.99	Science technologies, other	354	5	0
42.00	Psychology	973	10	0
42.01	Psychology, general	930	0	0
42.02	Clinical psychology	0	6	0
42.06	Counseling psychology	3	0	0
42.16	Social psychology	22	0	0
42.99	Psychology, other	18	4	0
43.00	Protective services	12,989	1,674	1,018
43.01	Criminal justice	10,733	1,419	795
43.02	Fire protection	2,139	229	191
43.0201	Fire control and safety technology	1,409	147	43
43.0203	Firefighting	471	54	146
43.99	Protective services, other	117	26	32
44.00	Public affairs	2,683	284	51
44.01	Public affairs, general	313	68	12
44.02	Community services	535	19	7
44.04	Public administration	95	10	16
44.05	Public policy studies	19	0	0
44.06	Public works	51	10	1
44.07	Social work	969	94	14
44.99	Public affairs, other	701	83	1
45.00	Social sciences	2,755	41	4
45.01	Social sciences, general	1,701	1	0
45.02	Anthropology	42	0	0
45.03	Archeology	2	18	0
45.04	Criminology	75	0	0
45.05	Demography	4	0	0
45.06	Economics	99	0	0
45.07	Geography	43	2	0
45.08	History	211	1	0
45.09	International relations	3	16	0
45.10	Political science and government	201	1	0
45.11	Sociology	284	1	0
45.12	Urban studies	8	0	0
45.99	Social sciences, other	82	1	4
46.00	Construction trades	2,382	5,305	599
46.01	Brickmasonry, stonemasonry, and tile setting	10	171	110
46.0101	Brickmasonry, stonemasonry, and tile setting, general	2	42	76
46.0102	Brick, block, and stone masonry	2	124	34
46.02	Carpentry	428	1,156	133
46.03	Electrical and power transmission installation	394	2,693	113
46.04	Miscellaneous construction trades	302	293	37
46.05	Plumbing, pipefitting, and steamfitting	57	428	68
46.99	Construction trades, other	1,191	564	138
47.00	Mechanics and repairers	8,636	13,805	2,380
47.01	Electrical and electronics equipment repair	2,074	2,740	917
47.0101	Electrical and electronics equipment, general	555	1,203	92
47.0102	Business machine repair	18	46	6
47.0103	Communication electronics	415	498	184
47.0104	Computer electronics	606	341	452
47.0105	Industrial electronics	362	303	57
47.0106	Major appliance repair	19	104	50
47.0108	Small appliance repair	1	13	0
47.0109	Vending and recreational machine repair	2	17	0
47.02	Heating, air conditioning, and refrigeration mechanics	729	2,024	182
47.03	Industrial equipment maintenance and repair	373	809	43
47.0302	Heavy equipment maintenance and repair	100	257	12

See footnote at end of table.

Table E-4. Continued—Associate degrees and other formal awards below the baccalaureate level granted in 1982-83

CIP code[1]	Curriculum	Associate degrees	Curriculums of at least 1 but less than 4 years	Curriculums of under 1 year
47.04	Miscellaneous mechanics and repairers	125	281	17
47.0406	Shoe and boot repair	4	29	2
47.05	Stationary energy sources	9	52	13
47.06	Vehicle and mobile equipment mechanics and repairers	5,015	7,729	1,200
47.0602	Aircraft mechanics	1,528	659	37
47.0603	Automotive body repair	331	1,430	172
47.0604	Automotive mechanics	1,875	3,349	521
47.0605	Diesel engine mechanics	748	1,699	372
47.0606	Small engine repair	34	347	64
47.99	Mechanics and repairers, other	311	170	8
48.00	Precision production	8,570	9,767	1,731
48.01	Drafting	3,372	1,900	268
48.02	Graphic and printing communications	3,101	1,063	95
48.0205	Composition, make-up, and typesetting	19	42	0
48.0206	Lithography, photography, and platemaking	221	76	0
48.03	Leatherworking and upholstering	44	138	69
48.04	Precision food production	0	134	180
48.05	Precision metal work	1,798	6,104	1,034
48.06	Precision work, assorted materials	51	120	83
48.0602	Jewelry design, fabrication, and repair	2	100	83
48.07	Woodworking	99	240	2
48.99	Precision production, other	105	68	0
49.00	Transportation and material moving	1,600	634	742
49.01	Air transportation	1,245	291	18
49.0101	Air transportation, general	242	63	0
49.0102	Airplane piloting and navigation	395	148	18
49.02	Vehicle equipment operation	64	219	704
49.0205	Truck and bus driving	63	112	602
49.03	Water transportation	195	103	6
49.99	Transportation and material moving, other	96	21	14
50.00	Visual and performing arts	6,365	780	81
50.01	Visual and performing arts, general	418	22	0
50.02	Crafts	37	33	0
50.03	Dance	31	7	0
50.04	Design	768	155	0
50.05	Dramatic arts	225	80	0
50.06	Film arts	300	58	0
50.0605	Photography	250	51	0
50.07	Fine arts	1,654	70	0
50.08	Graphic arts technology	2,030	186	42
50.09	Music	695	152	0
50.0901	Music, general	596	17	0
50.0903	Music performance	62	46	0
50.0904	Music theory and composition	9	12	0
50.99	Visual and performing arts, other	207	17	19

[1]CIP codes are the taxonomy used by the National Center for Education Statistics to classify instructional programs. See *A Classification of Instructional Programs* (U.S. Department of Education, 1981).

SOURCE: U.S. Department of Education, National Center for Education Statistics, Higher Education General Information Survery.

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Table E-5. Bachelor's, master's, and doctor's degrees conferred in institutions of higher education by field of study, 1982-83

CIP code[1]	Major field of study	Bachelor's degrees requiring 4 or 5 years	Master's degrees	Doctor's degrees (Ph.D., Ed.D., etc.)
	All fields	969,504	289,921	32,775
01.00	Agribusiness and agricultural production	5,757	833	196
01.01	Agricultural business and management	4,102	666	166
01.02	Agricultural mechanics	362	20	0
01.03	Agricultural production	134	39	6
01.04	Agricultural products and processing	7	3	4
01.05	Agricultural services and supplies	20	0	0
01.06	Horticulture	308	23	8
01.07	International agriculture	16	20	0
01.99	Agribusiness and agricultural production, other	808	62	12
02.00	Agricultural sciences	10,270	2,265	745
02.01	Agricultural sciences, general	1,681	297	7
02.02	Animal sciences	4,111	584	195
02.03	Food sciences	637	276	103
02.04	Plant sciences	3,197	922	347
02.0402	Agronomy	1,020	386	203
02.0409	Range management	194	76	19
02.05	Soil sciences	264	144	67
02.99	Agricultural sciences, other	380	42	26
03.00	Renewable natural resources	4,882	1,156	208
03.01	Renewable natural resources, general	1,361	295	37
03.02	Conservation and regulation	358	23	0
03.03	Fishing and fisheries	189	88	26
03.04	Forestry production and processing	299	37	15
03.05	Forestry and related sciences	1,649	535	95
03.06	Wildlife management	794	135	25
03.99	Renewable natural resources, other	232	43	10
04.00	Architecture and environmental design	9,823	3,357	97
04.01	Architecture and environmental design, general	614	22	0
04.02	Architecture	4,587	1,630	26
04.03	City, community, and regional planning	450	1,043	67
04.04	Environmental design	986	86	2
04.05	Interior design	1,450	20	0
04.06	Landscape architecture	1,030	285	0
04.07	Urban design	3	107	1
04.99	Architecture and environmental design, other	703	164	1
05.00	Area and ethnic studies	2,971	826	153
05.01	Area studies	2,476	715	137
05.02	Ethnic studies	411	67	6
05.99	Area and ethnic studies, other	84	44	10
06.00	Business and management	220,077	65,245	809
06.01	Business and management, general	42,174	11,543	164
06.02	Accounting	45,732	3,046	66
06.03	Banking and finance	15,556	4,062	28
06.04	Business administration and management	67,984	36,596	357
06.0402	Contract management and procurement/purchasing	368	401	0
06.05	Business economics	3,209	333	44
06.06	Human resources development	488	421	4
06.07	Institutional management	3,486	268	1
06.08	Insurance and risk management	520	38	1
06.09	International business management	636	1,519	9
06.10	Investments and securities	197	166	0
06.11	Labor/industrial relations	1,296	898	11
06.12	Management information systems	1,784	359	0
06.13	Management science	2,091	875	49
06.1301	Business statistics	101	17	6
06.14	Marketing management and research	24,688	1,747	25
04.1401	Marketing management	23,464	1,599	22
06.15	Organizational behavior	436	289	19
06.16	Personnel management	2,020	247	3
06.17	Real estate	646	133	0
06.18	Small business management and ownership	92	0	0

See footnote at end of table.

Table E-5. Continued—Bachelor's, master's, and doctor's degrees conferred in institutions of higher education by field of study, 1982-83

CIP code[1]	Major field of study	Bachelor's degrees requiring 4 or 5 years	Master's degrees	Doctor's degrees (Ph.D., Ed.D., etc.)
06.19	Taxation	0	967	0
06.20	Trade and industrial supervision and management	622	32	0
06.99	Business and management, other	6,420	1,706	28
07.00	Business and office	3,465	31	0
07.01	Accounting, bookkeeping, and related programs	349	10	0
07.02	Banking and related financial programs	3	0	0
07.03	Business data processing and related programs	729	1	0
07.04	Office supervision and management	1,283	9	0
07.05	Personnel and training programs	0	8	0
07.06	Secretarial and related programs	871	0	0
07.07	Typing, general office, and related programs	2	0	0
07.99	Business and office, other	228	3	0
08.00	Marketing and distribution	3,303	43	0
08.01	Apparel and accessories marketing	760	0	0
08.02	Business and personal services marketing	632	3	0
08.03	Entrepreneurship	12	0	0
08.04	Financial services marketing	1	0	0
08.05	Floristry, farm, and garden supplies marketing	1	0	0
08.06	Food marketing	35	0	0
08.07	General marketing	1,268	10	0
08.08	Home and office products marketing	16	0	0
08.09	Hospitality and recreation marketing	85	0	0
08.10	Insurance marketing	7	0	0
08.11	Transportation and travel marketing	242	30	0
08.1101	Transportation and travel marketing, general	22	0	0
08.1104	Tourism	180	30	0
08.1105	Travel services marketing	40	0	0
08.12	Vehicles and petroleum marketing	6	0	0
08.99	Marketing and distribution, other	238	0	0
09.00	Communications	36,954	3,502	205
09.01	Communications, general	16,151	1,567	123
09.02	Advertising	2,081	165	0
09.03	Communications research	126	8	1
09.04	Journalism (mass communications)	10,074	1,102	40
09.05	Public relations	1,069	76	0
09.06	Radio/television news broadcast	897	36	1
09.07	Radio/television, general	5,218	298	20
09.99	Communications, other	1,338	248	20
10.00	Communication technologies	1,648	102	9
10.0104	Radio and television production and broadcasting technology	1,392	89	3
11.00	Computer and information sciences	24,506	5,321	262
11.01	Computer and information science, general	19,549	4,525	250
11.02	Computer programming	221	16	0
11.03	Data processing	860	68	0
11.04	Information sciences and systems	2,582	492	5
11.05	Systems analysis	257	53	0
11.99	Computer and information sciences, other	1,037	167	7
12.00	Consumer, personal, and miscellaneous services	47	0	0
12.03	Funeral services	47	0	0
13.00	Education	97,991	84,853	7,551
13.01	Education, general	1,528	8,153	1,146
13.02	Bilingual/bicultural education	110	191	16
13.03	Curriculum and instruction	305	3,836	866
13.04	Education administration	75	11,018	1,989
13.0401	Education administration, general	1	7,249	1,351
13.0402	Administration of special education	0	67	20
13.0403	Adult and continuing education administration	0	108	34
13.0405	Elementary and secondary education administration	66	1,402	70
13.0499	Education administration, other	8	649	36
13.05	Educational media	54	996	69

See footnote at end of table.

Table E-5. Continued—Bachelor's, master's, and doctor's degrees conferred in institutions of higher education by field of study, 1982-83

CIP code[1]	Major field of study	Bachelor's degrees requiring 4 or 5 years	Master's degrees	Doctor's degrees (Ph.D., Ed.D., etc.)
13.06	Evaluation and research	381	320	204
13.07	International and comparative education	0	17	7
13.08	School psychology	96	1,603	494
13.09	Social foundations	75	272	111
13.10	Special education	11,418	11,301	271
13.11	Student counseling and personnel services	143	9,915	512
13.12	Teacher education, general programs	43,125	17,276	479
13.1202	Elementary education	34,876	10,588	145
13.1203	Junior high education	424	315	4
13.1204	Pre-elementary education	4,681	1,590	48
13.1205	Secondary education	2,508	3,501	117
13.13	Teacher education, specific subject areas	37,867	16,044	1,013
13.14	Teaching English as a second language/foreign language	21	666	4
13.99	Education, other	2,793	3,245	370
14.00	Engineering	72,248	18,830	2,822
14.01	Engineering, general	3,357	1,311	284
14.02	Aerospace, aeronautical, and astronautical engineering	2,127	491	90
14.03	Agricultural engineering	776	131	40
14.04	Architectural engineering	465	28	0
14.05	Bioengineering and biomedical engineering	529	228	43
14.06	Ceramic engineering	311	74	22
14.07	Chemical engineering	7,185	1,368	319
14.08	Civil engineering	9,989	3,074	340
14.09	Computer engineering	1,015	287	23
14.10	Electrical engineering	18,049	4,531	550
14.11	Engineering mechanics	302	172	55
14.12	Engineering physics	291	77	14
14.13	Engineering science	216	81	22
14.14	Environmental health engineering	228	394	35
14.15	Geological engineering	347	54	6
14.16	Geophysical engineering	93	10	2
14.17	Industrial engineering	3,748	1,432	118
14.18	Materials engineering	434	301	146
14.19	Mechanical engineering	15,675	2,511	299
14.20	Metallurgical engineering	645	253	79
14.21	Mining and mineral engineering	597	131	22
14.22	Naval architecture and marine engineering	629	62	2
14.23	Nuclear engineering	391	292	109
14.24	Ocean engineering	181	85	15
14.25	Petroleum engineering	1,294	174	14
14.26	Surveying and mapping sciences	85	23	4
14.27	Systems engineering	270	149	24
14.28	Textile engineering	41	0	0
14.99	Engineering, other	2,978	1,106	145
15.00	Engineering and engineering-related technologies	16,951	520	9
15.01	Architectural technologies	1,042	13	0
15.02	Civil technologies	1,006	0	0
15.0203	Surveying and mapping technology	26	0	0
15.03	Electrical and electronic technologies	3,759	12	0
15.0302	Electrical technology	829	0	0
15.0303	Electronic technology	2,413	0	0
15.04	Electromechanical instrumentation and maintenance technologies	113	7	2
15.05	Environmental control technologies	203	36	0
15.0506	Water and wastewater technology	15	4	0
15.06	Industrial production technologies	4,169	232	2
15.07	Quality control and safety technologies	338	105	0
15.08	Mechanical and related technologies	2,440	0	0
15.0803	Automotive technology	200	0	0
15.09	Mining and petroleum technologies	184	11	5
15.99	Engineering and engineering-related technologies, other	3,697	104	0
16.00	Foreign languages	9,685	1,759	488
16.01	Foreign languages, multiple emphasis	662	164	52
16.02	African (non-Semitic) languages	1	8	3
16.03	Asiatic languages	224	54	20

See footnote at end of table.

Table E-5. Continued—Bachelor's, master's, and doctor's degrees conferred in institutions of higher education by field of study, 1982-83

CIP code[1]	Major field of study	Bachelor's degrees requiring 4 or 5 years	Master's degrees	Doctor's degrees (Ph.D., Ed.D., etc.)
16.04	Balto-Slavic languages	390	95	23
16.05	Germanic languages	1,426	292	73
16.06	Greek	66	10	1
16.07	Indic languages	4	4	9
16.08	Iranian languages	0	0	0
16.09	Italic languages	6,648	958	267
16.10	Native American languages	1	0	0
16.11	Semitic languages	66	48	9
16.99	Foreign languages, other	197	126	31
17.00	Allied health	13,204	2,604	46
17.01	Dental services	1,209	25	0
17.0101	Dental assisting	27	0	0
17.0102	Dental hygiene	1,166	20	0
17.02	Diagnostic and treatment services	592	49	0
17.0209	Radiographic medical technology	313	23	0
17.0210	Respiratory therapy technology	23	0	0
17.03	Medical laboratory technologies	2,632	95	0
17.04	Mental health/human services	644	962	28
17.05	Miscellaneous allied health services	727	52	0
17.0508	Physician assisting-primary care	535	31	0
17.0509	Physician assisting-specialty	52	3	0
17.06	Nursing-related services	364	1	0
17.07	Ophthalmic services	1	0	0
17.08	Rehabilitation services	5,823	1,079	3
17.0807	Occupational therapy	1,807	234	0
17.0813	Physical therapy	2,581	303	1
17.0816	Recreational therapy	169	12	1
17.0818	Respiratory therapy	205	4	0
17.99	Allied health, other	1,212	341	15
18.00	Health sciences	51,410	14,464	1,109
18.01	Audiology and speech pathology	3,041	2,859	93
18.02	Basic clinical health sciences	97	164	84
18.03	Chiropractic	76	0	0
18.04	Dentistry	92	403	24
18.06	Epidemiology	0	128	38
18.07	Health sciences administration	3,102	2,014	34
18.08	Hematology	0	3	0
18.09	Medical laboratory	1,508	92	1
18.10	Medicine	236	188	252
18.11	Nursing	32,161	5,946	166
18.12	Optometry	275	13	3
18.13	Osteopathic medicine	5	39	12
18.14	Pharmacy	5,708	331	111
18.15	Podiatry	1	4	0
18.16	Population and family planning	4	26	1
18.17	Pre-denistry	133	0	0
18.18	Pre-medicine	738	0	1
18.19	Pre-pharmacy	3	0	0
18.20	Pre-veterinary	166	3	0
18.22	Public health laboratory science	226	1,113	95
18.23	Toxicology (clinical)	6	1	2
18.24	Veterinary medicine	210	185	91
18.99	Health sciences, other	3,622	952	92
19.00	Home economics	15,555	2,285	241
19.01	Home economics, general	4,490	653	60
19.02	Business home economics	168	0	0
19.03	Family and community services	313	19	0
19.04	Family/consumer resource management	745	47	3
19.05	Food sciences and human nutrition	3,354	783	63
19.06	Human environment and housing	573	18	0
19.07	Individual and family development	2,259	537	84
19.09	Textiles and clothing	3,213	128	13
19.99	Home economics, other	440	100	18

See footnote at end of table.

Table E-5. Continued—Bachelor's, master's, and doctor's degrees conferred in institutions of higher education by field of study, 1982-83

CIP code[1]	Major field of study	Bachelor's degrees requiring 4 or 5 years	Master's degrees	Doctor's degrees (Ph.D., Ed.D., etc.)
20.00	Vocational home economics	1,150	121	14
20.01	Consumer and homemaking home economics	747	75	14
20.02	Child care and guidance management and services	34	5	0
20.03	Clothing, apparel, and textiles management, production, and services	1	0	0
20.04	Food production, management, and services	30	8	0
20.05	Home furnishings and equipment management, production, and services	53	2	0
20.06	Institutional, home management, and supporting services	273	31	0
20.0601	Institutional, home management, and supporting services, general	271	31	0
20.99	Vocational home economics, other	12	0	0
22.00	Law	1,099	2,091	72
22.0103	Legal assisting	300	0	0
23.00	Letters	32,743	5,767	1,176
23.01	English, general	22,656	3,533	666
23.02	Classics	442	122	39
23.03	Comparative literature	502	182	114
23.04	Composition	93	7	0
23.05	Creative writing	411	282	0
23.06	Linguistics (includes phonetics, semantics, and philology)	472	597	146
23.07	Literature, American	121	9	5
23.08	Literature, English	1,278	197	66
23.09	Rhetoric	37	2	1
23.10	Speech, debate, and forensics	5,596	665	96
23.11	Technical and business writing	129	18	0
23.99	Letters, other	1,006	153	43
24.00	Liberal/general studies	18,524	889	55
25.00	Library and archival sciences	258	3,979	52
25.01	Library and archival sciences, general	19	881	4
25.02	Archival science	2	1	0
25.04	Library science	234	2,994	48
25.05	Museology	2	74	0
25.99	Library and archival sciences, other	1	29	0
26.00	Life sciences	39,982	5,696	3,341
26.01	Biology, general	28,022	2,354	521
26.02	Biochemistry and biophysics	1,876	270	518
26.03	Botany	620	412	283
26.04	Cell and molecular biology	474	45	130
26.05	Microbiology	2,141	406	319
26.06	Miscellaneous specialized areas, life sciences	1,769	978	482
26.07	Zoology	3,585	1,006	911
26.99	Life sciences, other	1,495	225	177
27.00	Mathematics	12,453	2,837	698
27.01	Mathematics, general	10,745	1,924	481
27.02	Actuarial sciences	159	27	1
27.03	Applied mathematics	573	259	52
27.04	Pure mathematics	86	21	22
27.05	Statistics	273	459	128
27.99	Mathematics, other	617	147	14
28.00	Military sciences	161	76	0
28.01	Aerospace science (Air Force)	19	0	0
28.03	Military science (Army)	9	0	0
28.04	Naval science (Navy, Marines)	1	0	0
28.99	Military science, other	132	76	0
29.00	Military technologies	106	34	0
30.00	Multi/interdisciplinary studies	17,282	2,930	387
30.01	Biological and physical sciences	3,074	306	23
30.02	Clinical pastoral care	1	89	0
30.03	Engineering and other disciplines	286	879	23
30.04	Humanities and social sciences	3,079	397	160

See footnote at end of table.

Table E-5. Continued—Bachelor's, master's, and doctor's degrees conferred in institutions of higher education by field of study, 1982-83

CIP code	Major field of study	Bachelor's degrees requiring 4 or 5 years	Master's degrees	Doctor's degrees (Ph.D., Ed.D., etc.)
30.05	Peace studies	18	1	1
30.06	Systems science	43	54	8
30.07	Women's studies	97	19	2
30.99	Multi/interdisciplinary studies, other	10,684	1,185	170
31.00	Parks and recreation	5,198	565	33
31.01	Parks and recreation, general	2,084	197	17
31.02	Outdoor recreation	136	48	0
31.03	Parks and recreation management	2,672	268	8
31.04	Water resources	35	41	2
31.99	Parks and recreation, other	271	11	6
38.00	Philosophy and religion	6,483	1,091	404
38.01	Philosophy	3,322	467	232
38.02	Religion	2,803	597	166
38.99	Philosophy and religion, other	358	27	6
39.00	Theology	6,053	4,782	1,208
39.01	Biblical languages	69	46	3
39.02	Bible studies	1,775	251	14
39.03	Missionary studies	179	57	18
39.04	Religious education	1,224	854	62
39.05	Religious music	210	133	19
39.06	Theological studies	1,927	2,602	896
39.99	Theology, other	669	839	196
40.00	Physical sciences	23,234	5,277	3,269
40.01	Physical sciences, general	592	47	
40.02	Astronomy	75	58	60
40.03	Astrophysics	20	9	17
40.04	Atmospheric sciences and meteorology	396	183	80
40.05	Chemistry	10,796	1,622	1,746
40.06	Geological sciences	6,102	1,552	295
40.07	Miscellaneous physical sciences	875	309	126
40.08	Physics	3,793	1,369	873
40.09	Planetary science	1	1	2
40.99	Physical sciences, other	584	127	66
41.00	Science technologies	171	13	0
41.01	Biological technologies	79	3	0
41.02	Nuclear technologies	15	5	0
41.03	Physical science technologies	49	4	0
41.99	Science technologies, other	28	1	0
42.00	Psychology	40,364	8,378	3,108
42.01	Psychology, general	37,781	4,111	1,783
42.02	Clinical psychology	64	677	681
42.03	Cognitive psychology	12	3	5
42.04	Community psychology	12	39	4
42.06	Counseling psychology	104	1,815	183
42.07	Developmental psychology	244	177	54
42.08	Experimental psychology	256	68	64
42.09	Industrial and organizational psychology	68	319	15
42.10	Personality psychology	0	0	1
42.11	Physiological psychology	132	6	21
42.12	Psycholinguistics	0	0	0
42.13	Psychometrics	0	19	4
42.14	Psychopharmacology	2	0	0
42.15	Quantitative psychology	5	26	8
42.16	Social psychology	409	97	30
42.99	Psychology, other	1,275	1,201	255
43.00	Protective services	12,579	1,300	38
43.01	Criminal justice	12,327	1,117	38
43.02	Fire protection	103	2	0
43.99	Protective services, other	149	181	0

See footnote at end of table.

Table E-5. Continued—Bachelor's, master's, and doctor's degrees conferred in institutions of higher education by field of study, 1982-83

CIP code[1]	Major field of study	Bachelor's degrees requiring 4 or 5 years	Master's degrees	Doctor's degrees (Ph.D., Ed.D., etc.)
44.00	Public affairs	14,627	16,154	347
44.01	Public affairs, general	658	721	16
44.02	Community services	1,182	212	14
44.03	International public service	127	86	0
44.04	Public administration	1,659	5,173	90
44.05	Public policy studies	196	248	19
44.06	Public works	60	57	3
44.07	Social work	10,263	9,244	201
44.99	Public affairs, other	482	413	4
45.00	Social sciences	95,088	11,112	2,931
45.01	Social sciences, general	3,694	395	32
45.02	Anthropology	2,806	788	369
45.03	Archeology	56	27	9
45.04	Criminology	1,337	61	5
45.05	Demography	4	43	5
45.06	Economics	20,517	1,972	734
45.07	Geography	3,341	573	124
45.08	History	16,465	2,040	575
45.09	International relations	2,702	1,137	44
45.10	Political science and government	25,791	1,829	435
45.11	Sociology	14,105	1,112	522
45.12	Urban studies	835	490	20
45.99	Social sciences, other	3,435	645	57
46.00	Construction trades	54	0	0
46.01	Brickmasonry, stonemasonry, and tile setting	1	0	0
46.05	Plumbing, pipefitting, and steamfitting	53	0	0
47.00	Mechanics and repairers	17	0	0
47.01	Electrical and electronics equipment repair	3	0	0
47.06	Vehicle and mobile equipment mechanics and repairers	14	0	0
48.00	Precision production	218	0	0
48.01	Drafting	2	0	0
48.02	Graphic and printing communications	199	0	0
48.05	Precision metal work	1	0	0
48.07	Woodworking	4	0	0
48.99	Precision production, other	12	0	0
49.00	Transportation and material moving	1,662	91	0
49.01	Air transportation	1,495	70	0
49.0101	Air transportation, general	407	0	0
49.0102	Airplane piloting and navigation	478	58	0
49.03	Water transportation	86	21	0
49.99	Transportation and material moving, other	81	0	0
50.00	Visual and performing arts	39,251	8,742	692
50.01	Visual and performing arts, general	1,680	221	10
50.02	Crafts	453	85	0
50.03	Dance	748	202	4
50.04	Design	4,049	248	1
50.05	Dramatic arts	5,208	1,157	97
50.06	Film arts	1,551	293	6
50.0605	Photography	772	89	0
50.07	Fine arts	16,107	2,833	153
50.08	Graphic arts technology	191	16	0
50.09	Music	7,910	3,551	421
50.0901	Music, general	4,287	1,437	214
50.0903	Music performance	2,580	1,554	103
50.0904	Music theory and composition	395	231	63
50.99	Visual and performing arts, other	1,354	136	0

[1] CIP codes are the taxonomy used by the National Center for Education Statistics to classify instructional programs. See *A Classification of Instructional Programs* (U.S. Department of Education, 1981).

SOURCE: U.S. Department of Education, National Center for Education Statistics, surveys of "Earned Degrees Conferred."

Table E-6. First professional degrees[1] conferred by institutions of higher education, 1982-83

Field of study	Degrees conferred
Total, all institutions	72,823
Chiropractic (D.C. or D.C.M.)	2,889
Dentistry (D.D.S. or D.M.D.)	5,585
Medicine (M.D.)	15,484
Optometry (O.D.)	1,116
Osteopathic medicine (D.O.)	1,319
Pharmacy (D. Phar.)	705
Podiatry (Pod. D. or D.P.) or Podiatric medicine (D.P.M.)	631
Veterinary medicine (D.V.M.)	2,060
Law (LL B. or J.D.)	36,540
Theology (B.D., M. Div., or Rabbi)	6,494

[1]Degrees that require at least 6 years of college work for completion (including at least 2 years of preprofessional training).

SOURCE: U.S. Department of Education, National Center for Education Statistics, surveys of "Earned Degrees Conferred."

Appendix F. Sources of State and Local Job Outlook Information

State and local job market and career information is available from State employment security agencies and State Occupational Information Coordinating Committees (SOICC's). In general, State employment security agencies develop occupational employment projections and other local labor market information. SOICC's help people locate labor market and career information available within their State. Many SOICC's also provide a variety of occupational resources and career information. For each State, the District of Columbia, and Puerto Rico, the following list provides the title, address, and telephone number of the State employment security agency's chief and the SOICC director.

Alabama

Chief, Research and Statistics Division, Department of Industrial Relations, Industrial Relations Building, Room 427, 649 Monroe Street, Montgomery, Ala. 36130. Phone: (205) 261-5461.

Director, Alabama Occupational Information Coordinating Committee, Bell Building, Suite 400, 207 Montgomery Street, Montgomery, Ala. 36130. Phone: (205) 261-2990.

Alaska

Chief, Research and Analysis Section, Alaska Department of Labor, P.O. Box 1149, Juneau, Alaska 99802. Phone: (907) 465-4500.

Coordinator, Alaska Occupational Information Coordinating Committee, Alaska Department of Labor, P.O. Box 1149, Juneau, Alaska 99802. Phone: (907) 465-4518.

Arizona

Research Administrator, Labor Market Information, Research and Analysis Section, Department of Economic Security, 733-A, P.O. Box 6123, Phoenix, Ariz. 85005. Phone: (602) 255-3616.

Executive Director, Arizona State Occupational Information Coordinating Committee, P.O. Box 6123, Site Code 897J, Phoenix, Ariz. 85005. Phone: (602) 255-3680.

Arkansas

Chief, Research and Analysis Section, Employment Security Division, Arkansas Department of Labor, P.O. Box 2981, Little Rock, Ark. 72203. Phone: (501) 371-1541.

Executive Director, Arkansas Occupational Information Coordinating Committee, Research and Analysis Section, Arkansas Employment Security Division, P.O. Box 2981, Little Rock, Ark. 72203. Phone: (501) 371-1541.

California

Chief, Employment Data and Research Division, Employment Development Department, P.O. Box 1679, Sacramento, Calif. 95808. Phone: (916) 427-4675.

Executive Director, California Occupational Information Coordinating Committee, 800 Capitol Mall, MIC-67, Sacramento, Calif. 95814. Phone: (916) 323-6544.

Colorado

Chief, Research and Development, Colorado Division of Employment and Training, 1330 Fox Street, Denver, Colo. 80204. Phone: (303) 866-6316.

Director, Colorado Occupational Information Coordinating Committee, 218 Centennial Building, 1313 Sherman Street, Denver, Colo. 80203. Phone: (303) 866-4488.

Connecticut

Director, Research and Information, Employment Security Division, Connecticut Labor Department, 200 Folly Brook Boulevard, Wethersfield, Conn. 06109. Phone: (203) 566-2120.

Executive Director, Connecticut Occupational Information Coordinating Committee, c/o Vocational Rehabilitation District Office, 56 Arbor Street, 2nd Floor, Hartford, Conn. 06106. Phone: (203) 566-2502.

Delaware

Chief, Office of Occupational and Labor Market Information, Delaware Department of Labor, P.O. Box 9029, Newark, Del. 19714. Phone: (302) 368-6962.

Chief, Office of Occupational and Labor Market Information, Delaware Department of Labor, University Office Plaza, P.O. Box 9029, Newark, Del. 19711. Phone: (302) 368-6962.

District of Columbia

Chief, Division of Labor Market Information, Research and Analysis, District of Columbia Department of Employment Services, 500 C Street, NW., Room 411, Washington, D.C. 20001. Phone: (202) 639-1642.

Executive Director, District of Columbia Occupational Information Coordinating Commttee, Department of Employment Services, 500 C Street, NW., Room 207, Washington, D.C. 20001. Phone: (202) 639-1083.

Florida

Chief, Bureau of Research and Information, Florida Department of Labor and Employment Security, Suite 201, 2574 Seagate Drive, Tallahassee, Fla. 32301. Phone: (904) 488-6037.

Director, Florida Job Training Coordinating Council, 204 Atkins Building, 1320 Executive Center Drive, Tallahassee, Fla. 32301. Phone: (904) 487-2730.

Georgia

Director, Labor Information Systems, Georgia Department of Labor, 254 Washington Street, SW., Atlanta, Ga. 30334. Phone: (404) 656-3177

Executive Director, Georgia Occupational Information Coordinating Committee, 501 Pulliam Street, SW., Suite 211, Atlanta, Ga. 30312. Phone: (404) 656-3117.

Hawaii

Chief, Research and Statistics Office, Department of Labor and Industrial Relations, 830 Punchbowl Street, Room 304, Honolulu, Hawaii 96813. Phone: (808) 548-7639.

Executive Director, Hawaii State Occupational Information Coordinating Committee, 830 Punchbowl Street, Room 315, Honolulu, Hawaii 96813. Phone: (808) 548-3496.

Idaho

Chief, Research and Analysis, Idaho Department of Employment, 317 Main Street, P.O. Box 35, Boise, Idaho 83735. Phone: (208) 544-2755.

Director, Idaho Occupational Information Coordinating Committee, Len B. Jordan Building, Room 301, 650 W. State Street, Boise, Idaho 83720. Phone: (208) 334-3705.

Illinois

Director, Research and Analysis Division, Illinois Bureau of Employment Security, 910 S. Michigan Avenue, 12th Floor, Chicago, Ill. 60605. Phone: (312) 793-2316.

Executive Director, Illinois Occupational Information Coordinating Committee, 217 E. Monroe, Suite 203, Springfield, Ill. 62706. Phone: (217) 785-0789.

Indiana

Chief, Labor Market Information and Statistical Service, Indiana Employment Security Division, 10 N. Senate Avenue, Indianapolis, Ind. 46204. Phone: (317) 232-7701.

Executive Director, Indiana Occupational Information Coordinating Committee, 10 N. Senate Avenue, Room 313, Indianapolis, Ind. 46204. Phone: (317) 232-0173.

Iowa

Chief, Audit and Analysis, Iowa Department of Job Service, 1000 E. Grand Avenue, Des Moines, Iowa 50319. Phone: (515) 281-8181.

Executive Director, Iowa Occupational Information Coordinating Committee, 523 E. 12th Street, Des Moines, Iowa 50319. Phone: (515) 281-8076.

Kansas

Chief, Research and Analysis, Kansas Department of Human Resources, 401 Topeka Avenue, Topeka, Kans. 66603. Phone: (913) 296-5061.

Director, Kansas Occupational Information Coordinating Committee, 401 Topeka Avenue, Topeka, Kans. 66603. Phone: (913) 296-3428.

Kentucky

Manager, Labor Market Research and Analysis Branch, Department for Employment Services, Cabinet for Human Resources, 275 E. Main Street, Frankfort, Ky. 40621. Phone: (502) 564-7976.

Coordinator, Kentucky Occupational Information Coordinating Committee, 275 E. Main Street, 2 East, Frankfort, Ky. 40621. Phone: (502) 564-4258.

Louisiana

Director, Research and Statistics Section, Louisiana State Department of Labor, P.O. Box 44094, Capitol Station, 1001 N. 23rd Street, Baton Rouge, La. 70804. Phone: (504) 342-3140.

Coordinator, Louisiana Occupational Information Coordinating Committee, P.O. Box 94094, Baton Rouge, La. 70804. Phone: (504) 342-5151.

Maine

Director, Division of Research and Analysis, Bureau of Employment Security, Maine Department of Labor, 20 Union Street, Augusta, Maine 04330. Phone: (207) 289-2271.

Executive Director, Maine Occupational Information Coordinating Committee, State House Station 71, Augusta, Maine 04333. Phone: (207) 289-2331.

Maryland

Director, Research and Analysis Division, Maryland Department of Human Resources, Employment Security Administration, 1100 N. Eutaw Street, Baltimore, Md. 21201. Phone: (301) 383-5000.

Executive Director, Maryland Occupational Information Coordinating Committee, Governor's Employment and Training Council, 1123 N. Eutaw Street, Suite 720, Baltimore, Md. 21201. Phone: (301) 383-6730.

Massachusetts

Director, Job Market Research and Policy, Massachusetts Division of Employment Security, Charles F. Hurley Building, Government Center, Boston, Mass. 02114. Phone: (617) 727-6556.

Director, Massachusetts Occupational Information Coordinating Committee, Massachusetts Division of Employment Security, Charles F. Hurley Building, 2nd Floor, Government Center, Boston, Mass. 02114. Phone: (617) 727-6718.

Michigan

Director, Research and Statistics Division, Michigan Employment Security Commission, 7310 Woodward Avenue, Detroit, Mich. 48202. Phone: (313) 876-5445.

Executive Coordinator, Michigan Occupational Information Coordinating Committee, 309 N. Washington, P.O. Box 30015, Lansing, Mich. 48909. Phone: (517) 373-0363.

Minnesota

Director, Research and Statistical Services Office, Minnesota Department of Jobs and Training, 390 N. Robert Street, St. Paul, Minn. 55101. Phone: (612) 296-6545.

Director, Minnesota Occupational Information Coordinating Committee, Minnesota Department of Jobs and Training, 690 American Center Building , 150 E. Kellogg Boulevard, St. Paul, Minn. 55101. Phone: (612) 296-2072.

Mississippi

Chief, Labor Market Information Department, Mississppi Employment Security Commission, P.O. Box 1699, Jackson, Miss. 39215. Phone: (601) 961-7424.

Executive Director, Mississippi Occupational Information Coordinating Committe, 1101 Sillers Building, P.O. Box 771, Jackson, Miss. 39205. Phone: (601) 359-3412.

Missouri

Chief, Research and Analysis, Missouri Division of Employment Security, P.O. Box 59, Jefferson City, Mo. 65104. Phone: (314) 751-3591.

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Montana

Chief, Research and Analysis, Department of Labor and Industry, P.O. Box 1728, Helena, Mont. 59624. Phone: (406) 444-2661.

Program Manager, Montana Occupational Information Coordinating Committee, P.O. Box 1728, Helena, Mont. 59624. Phone: (406) 444-2741.

Nebraska

Chief, Research and Statistics, Division of Employment, Nebraska Department of Labor, P.O. Box 94600, Lincoln, Nebr. 68509. Phone: (402) 475-8451.

Administrator, Nebraska Occupational Information Coordinating Committee, P.O. Box 94600, State House Station, Lincoln, Nebr. 68509. Phone: (402) 475-8451.

Nevada

Chief, Employment Security Research, Nevada Employment Security Department, 500 E. Third Street, Carson City, Nev. 89713. Phone: (702) 885-4550.

Director, Nevada Occupational Information Coordinating Committee, Capitol Complex, 601 Kinkead Building, 505 E. King Street, Carson City, Nev. 89710. Phone: (702) 885-4577.

New Hampshire

Director, Economic Analysis and Reports, New Hampshire Department of Employment Security, 32 S. Main Street, Concord, N.H. 03301. Phone: (603) 224-3311.

Director, New Hampshire State Occupational Information Coordinating Committee, 155 Manchester Street, Concord, N.H. 03301. Phone: (603) 228-9500.

New Jersey

Director, Division of Planning and Research, New Jersey Department of Labor, P.O. Box 2765, Trenton, N.J. 08625. Phone: (609) 272-2643.

Staff Director, New Jersey Occupational Information Coordinating Committee, Labor and Industry Building, P.O. Box CN 056, Trenton, N.J. 08625. Phone: (609) 292-2682.

New Mexico

Chief, Economic Research and Analysis, Employment Security Department, P.O. Box 1928, Albuquerque, N.M. 87103. Phone: (505) 841-8647.

Executive Director, New Mexico Occupational Information Coordinating Committee, Tiwa Building, 401 Broadway, NE., P.O. Box 1928, Albuquerque, N.M. 87103. Phone: (505) 841-8388.

New York

Director, Division of Research and Statistics, New York State Department of Labor, State Campus, Building 12, Albany, N.Y. 12240. Phone: (518) 457-6181.

Executive Director, New York Occupational Information Coordinating Committee, New York Department of Labor, State Office Building Campus, Building 12, Albany, N.Y. 12240. Phone: (518) 457-2930.

North Carolina

Director, Labor Market Information Division, Employment Security Commission of North Carolina, P.O. Box 25903, Raleigh, N.C. 27611. Phone: (919) 733-2936.

Director, North Carolina Occupational Information Coordinating Committee, 1311 St. Mary's Street, Suite 250, P.O. Box 27625, Raleigh, N.C. 27611. Phone: (919) 733-6700.

North Dakota

Chief, Research and Statistics, Job Service North Dakota, P.O. Box 1537, Bismarck, N.D. 58502. Phone: (701) 224-2868.

Director, North Dakota Occupational Information Coordinating Committee, 1000 East Divide, P.O. Box 1537, Bismarck, N.D. 58502. Phone: (701) 224-2733.

Ohio

Director, Labor Market Information Division, Ohio Bureau of Employment Services, P.O. Box 1618, Columbus, Ohio 43216. Phone: (614) 466-8806.

Director, Ohio Occupational Information Coordinating Committee, Division of Labor Market Information, Ohio Bureau of Employment Services, 1160 Dublin Road, Building A, Columbus, Ohio 43215. Phone: (614) 466-8806.

Oklahoma

Chief, Research and Planning Division, Oklahoma Employment Security Commission, 310 Will Rogers Memorial Office Building, Oklahoma City, Okla. 73105. Phone: (405) 521-3765.

Executive Director, Oklahoma Occupational Information Coordinating Committee, Oklahoma Employment Security Commission, 309 Will Rogers Memorial Office Building, Oklahoma City, Okla. 73105. Phone: (405) 521-3763.

Oregon

Director, Research and Statistics, Employment Division, Department of Human Resources, 875 Union Street, NE., Salem, Oreg. 97311. Phone: (503) 378-3220.

Executive Director, Oregon Occupational Information Coordinating Committee, 875 Union Street, NE., Salem, Oreg. 97311. Phone: (503) 378-8146.

Pennsylvania

Chief, Research and Statistics Division, Pennsylvania Department of Labor and Industry, 7th and Forster Streets, Harrisburg, Pa. 17121. Phone: (717) 787-3265.

Director, Pennsylvania Occupational Information Coordinating Committee, Governor's Office of Policy Development, 506 Finance Building, P.O. Box 1323, Harrisburg, Pa. 17105. Phone: (717) 783-8384.

Puerto Rico

Chief, Department of Labor and Human Resources, Bureau of Labor Statistics, 505 Munoz Rivera Avenue, 17th Floor, Hato Rey, P.R. 00918. Phone: (809) 754-5339.

Executive Director, Puerto Rico Occupational Information Coordinating Committee, Prudencio Rivera Martinez Building, 19th Floor, 505 Munoz Rivera Avenue, Hato Rey, P.R. 00918. Phone: (809) 753-7110.

Rhode Island

Supervisor, Employment Security Research, Rhode Island Department of Employment Security, 24 Mason Street, Providence, R.I. 02903. Phone: (401) 277-3704.

Director, Rhode Island Occupational Information Coordinating Committee, 22 Hayes Street, Room 133, Providence, R.I. 02908. Phone: (401) 272-0830.

South Carolina

Director, Labor Market Information Division, South Carolina Employment Security Commission, P.O. Box 995, Columbia, S.C. 29202. Phone: (803) 758-8983.

Director, South Carolina Occupational Information Coordinating Committee, 1550 Gadsden Street, P.O. Box 995, Columbia, S.C. 29202. Phone: (803) 758-3165.

South Dakota

Chief, Labor Market Information Center, Department of Labor, P.O. Box 1730, Aberdeen, S.D. 57401. Phone: (605) 622-2314.

Executive Director, South Dakota Occupational Information Coordinating Committee, South Dakota Department of Labor, 607 N. 4th Street, Box 1730, Aberdeen, S.D. 57401. Phone: (605) 622-2314.

Tennessee

Chief, Research and Statistics, Tennessee Department of Employment Security, 519 Cordell Hull Building, 436 Sixth Avenue N., Nashville, Tenn. 37219. Phone: (615) 741-2284.

Director, Tennessee Occupational Information Coordinating Committee, 519 Cordell Hull Building, Nashville, Tenn. 37219. Phone: (615) 741-6451.

Texas

Chief, Economic Research and Analysis, Texas Employment Commission, 15th and Congress Avenue, Austin, Te . 78778. Phone: (512) 397-4540.

Director, Texas Occupational Information Coordinating Committee, TEC Building, 15th and Congress Avenue, Room 526T, Austin, Tex. 78778. Phone: (512) 463-2399.

Utah

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Vermont

Chief, Research and Statistics Section, Vermont Department of Employment and Training, P.O. Box 488, Montpelier, Vt. 05602. Phone: (802) 229-0311.

Chief, Vermont Occupational Information Coordinating Committee, Green Mountain Drive, P.O. Box 488, Montpelier, Vt. 05602. Phone: (802) 229-0311.

Virginia

Director, Office of Research and Analysis, Virginia Employment Commission, P.O. Box 1358, Richmond, Va. 23211. Phone: (804) 786-7496.

Executive Director, Virginia Occupational Information Coordinating Committee, Virginia Employment Commission, P.O. Box 1358, 703 E. Main Street, Richmond, Va. 23211. Phone: (804) 786-3177.

Washington

Director, Labor Market and Economic Analysis Branch, Washington Employment Security Department, 212 Maple Park, Olympia, Wash. 98504. Phone: (206) 753-5224.

Director, Washington Occupational Information Coordinating Committee, 212 Maple Park, MS KG-11, Olympia, Wash. 98504. Phone: (206) 754-1552.

West Virginia

Chief, Division of Labor and Economic Security, Department of Employment Security, 112 California Avenue, Charleston, W.Va. 25305. Phone: (304) 348-2660.

Executive Director, West Virginia State Occupational Information Coordinating Committee, 1600 1/2 Washington Street E., Charleston, W.Va. 25311. Phone: (304) 348-0061.

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Chief, Labor Market Information Section, Department of Industry, Labor and Human Relations, P.O. Box 7944, Madison, Wis. 53707. Phone: (608) 266-5843.

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Chief, Research and Analysis Section, Employment Security Commission, P.O. Box 2760, Casper, Wyo. 82602. Phone: (307) 235-3642.

Director, Wyoming Occupational Information Coordinating Committee, Occupational Information Program, Herschler Building, 2nd Floor E., Cheyenne, Wyo. 82002. Phone: (307) 777-7574.

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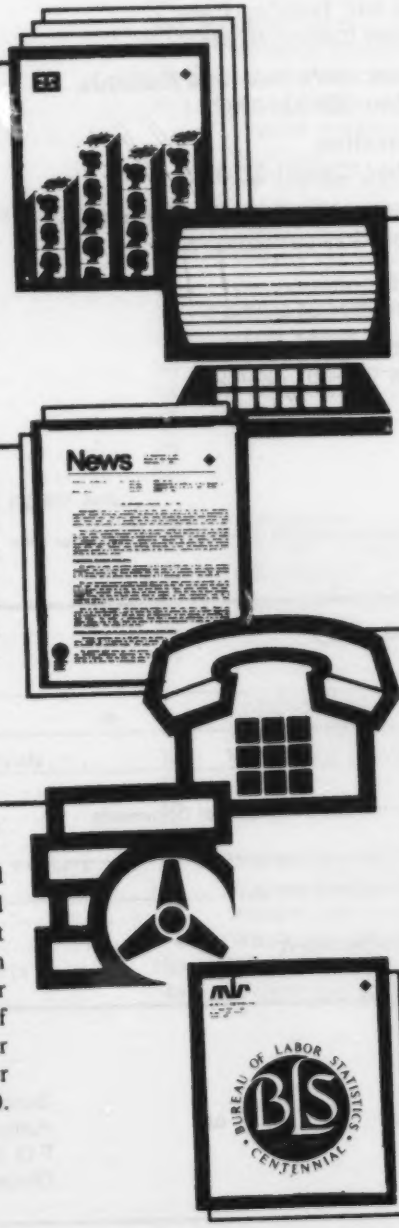

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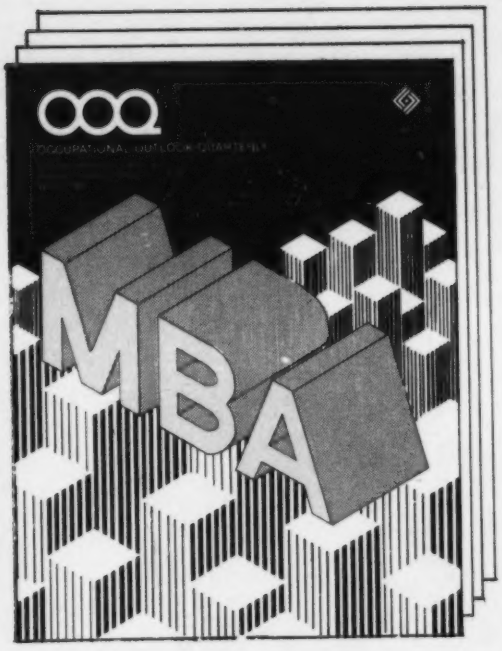

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